MANPOWER STUDY OF THE MINING INDUSTRY

REPORT 1

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ACKNOWLEDGEMENT

This report is the first of two publications to present the findings of a pilot manpower information project initiated by the British Columbia Government in conjunction with the Mining Association of British Columbia and the Federal Government. The principal objective of this cooperative project was to obtain information pertinent to the development of a manpower policy in both the private and public sectors and to ensure that public monies are allocated to post-secondary education and training in an effective manner. The mining industry was chosen as the pilot because of its importance to the provincial economy. The pilot proved successful and it is felt that this approach could be applied to other industries.

Without the support and guidance of the Mining Association of British Columbia it would have been impossible for this project to be mounted. Particular credit for the success of the project must go to the members of the mining industry, both employers and employees who gave time and effort to complete the survey questionnaire.

Special thanks is also expressed to the Federal Government for its participation in the project, particularly Statistics Canada and the Canada Employment and Immigration Commission.

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I. SUMMARY AND CONCLUSIONS

Methodology:

The Mining Industry Pilot Survey was initiated as a joint project among the Ministries of Labour, Education and Industry and Small Business Development/Central Statistics Bureau. The survey was designed both to satisfy the requirements of the provincial Manpower Forecasting Model and to provide manpower planners with information that would be of immediate use. The main characteristics of the methodology are as follows:

a) The method employed is unique in that both employers[1] and employees were surveyed.

b) Employer data was collected by means of structured questionnaires. Employers with fewer than 100 employees were asked to provide information over the phone; those with more than 100 employees were asked for personal interviews.

c) Employee data was also collected by means of structured questionnaires but completed through self-enumeration.

d) Every effort was made to ensure complete coverage of the industry, which entailed a great deal of staff time for follow-up and cross-checking of the information.

e) In order to develop linkages between employer and employee data, a sophisticated methodology was required. While this approach appears to have been successful in collecting the desired information, it was both time consuming and labour intensive.

Survey Findings:

The report addresses four broad topics: 1) Total Employment; 2) Distribution of Occupations; 3) Age Structure of the Mining Work Force, and 4) Apprenticeship Training Ratios. The major findings are summarized below:

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[1] NOTE: Self-employed operations were excluded

a) In terms of employment, the mining industry is dominated by a relatively small number of large employers.

b) The mining industry work force is relatively young compared to the Provincial work force as a whole.

c) The larger firms do most of the training. This is not surprising as the larger firms tend to employ most of the journeymen. Based on other sources (e.g. Critical Trade Skills Survey) it can be said that the industry appears to have a better training record than other industries.

d) The type of mining activity rather than size of establishment or geographical location is the most meaningful determinant of such factors as occupational distribution and work force age.

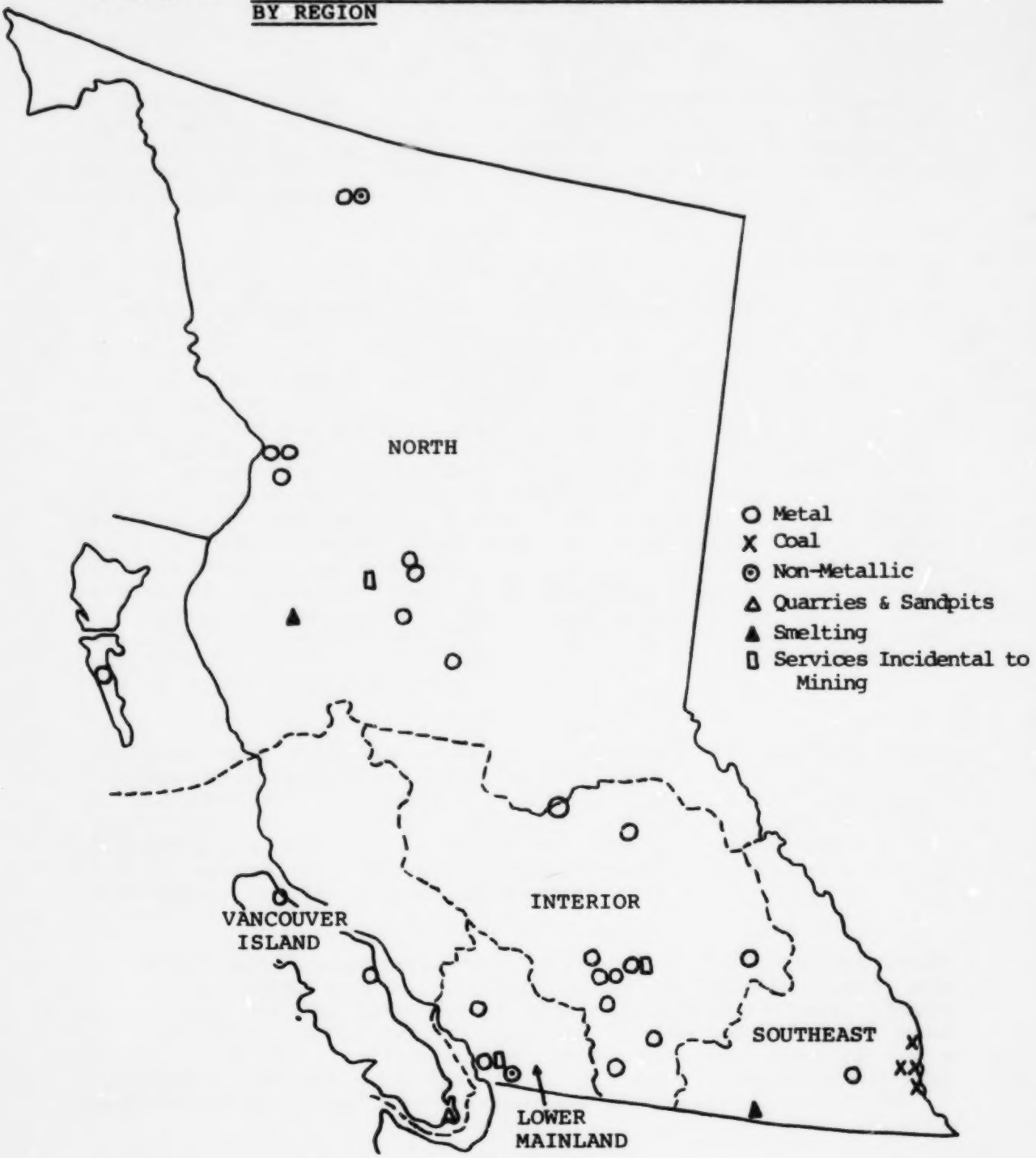
e) Sand pits and quarries, though considered technically to be part of the mining industry, displayed markedly different characteristics than the rest of the industry. Because of its dissimilar nature, analysis of this sub industry has not been included.

f) Regional data was collected but with the exception of the Apprenticeship Training Ratios did not provide significant insight into the occupational mix of the industry. Therefore, regional breakdowns are included in the tables but not in the analytical section of the report. (NOTE: Figure 1, page 3.)

3. Future Report:

The results of the employee questionnaire will be released in a future report. The structure of this questionnaire, together with linkages to the employer questionnaire, will provide a further indication of training needs, skills substitution and labour mobility.

FIGURE 1: NUMBER, TYPE AND LOCATION OF MINING ESTABLISHMENTS* BY REGION



*NOTE: Figure depicts establishments with fifty or more employees, (excluding 6 head offices in the Lower Mainland). Those establishments with fewer than 50 employees were also surveyed and are typically found in the Lower Mainland.

II. INTRODUCTION

At present, Federal and Provincial Governments are spending approximately $150 million annually on training in British Columbia. While the private sector's financial investment in manpower development cannot be accurately quantified, it is undoubtedly substantial.

To ensure that these dollars are allocated to develop skills that will be required by industry, accurate information relating to the demand and supply of manpower is required.

Some of the information is already available, but much is either not current, or suffers from other problems. The Statistics Canada Occupational Employment Surveys of 1975 and 1977 provide occupation by industry data, but there are doubts about the quality of the data and consistency between the two surveys. The monthly Labour Force Survey provides occupational data, but at too general a level to be useful for projecting training requirements. The 1981 Census provides useful data, but, it too lacks sufficient detail to answer many of the particular questions inherent in manpower planning and program development. The problem is further exacerbated by the fact that the various sources of information have been developed independent of one another thus making it difficult to compare them in a meaningful fashion.

In 1979, the Province first took steps to overcome these problems with the initiation of the Critical Skills Surveys. The surveys were developed to provide specific and comparable information on existing quantities of workers and industry generated projections of demands. Particular attention was paid to ensure that the methodology produced useful and timely information for the policy process.

The relatively unsophisticated approach of the Critical Trade Skills Surveys proved to be quite successful and was extensively used by both the private and public sectors. There are however a number of limitations to the methodology; most particularly the limited number of occupations covered (only designated trades) and the lack of data demonstrating the interrelationship between occupations and training.

To overcome these limitations, new approaches were examined and considered. One such approach is the development of a Manpower Forecasting Model by the Central Statistics Bureau. The purpose of this model is to determine the number and types of new jobs to be created in British Columbia during the next several years (demand) and to estimate the number of people and types of skills becoming available for work during the same period (supply). The model will identify imbalances between demand and supply and thereby permit the private sector and government agencies to more effectively plan to meet manpower requirements and implement education and training programs.

In summary, it was clear a new survey would have to be designed and carried out to meet the more immediate needs of manpower planners and to satisfy the requirements of the model for accurate and up-to-date data.

The first step was to design a pilot study and select a pilot industry. Next the Ministries of Labour and Education together with the Central Statistics Bureau of the Ministry of Industry and Small Business Development met and agreed to collaborate in the refinement of a general approach. Thirdly, individual employers were identified for survey purposes. (See Appendix 2a, page 75- 77 for a list of the participating establishments.) As a final step the survey was activated.

The mining industry was selected because in April 1982 production levels were fairly "normal", therefore it was felt that the distribution of occupations would also be fairly "normal". Other industries were considered but some had already begun to show signs of recession. Other criteria in the selection of the mining industry include:

1) it is easily identified;
2) it has a well organized association which is interested in this type of information;
3) it employs significant numbers of skilled workers.

The survey was carried out in two distinct phases. Phase I requested information from employers (representing existing demand for manpower), while Phase 2 covered employees (representing the employed supply of manpower). However, the survey did not attempt to estimate the total potential manpower supply by occupation to the mining industry since it

excluded employment in other industries, the unemployed and new entrants to the labour force from migration and other sources.

This paper presents the results of Phase 1 (employer survey) of the study. The results of Phase II (employee survey) will be contained in Report II to be prepared later during 1983.

III. GENERAL APPROACH

The purpose of the mining survey was to test the feasibility of collecting four broad categories of information which are needed in forecasting manpower requirements.

These broad categories are:

1) existing occupational demand in the form of the number of employees by job-type by industry;

2) relationship between selected occupations and the qualifications of encumbent employees;

3) expected manpower requirements for professionals, technicians and journeymen, 1984 and 1986;

4) the employers' assessment of the impact of technological change on the demand for selected skills.

This report addresses the first item. Item 2 will be covered in a second report to be issued later this year. Items 3 and 4 will not be reported on because of data problems caused by a drastic down turn in the economy which made it difficult for employers to respond to requests for information with a future orientation. Nearly two-thirds of the employers surveyed failed to respond to the forecast questions in a way suitable for analysis.

Employer Information

Employers were the major source of existing demand data for occupations of interest in the managerial, professional, technical and trades categories. They were asked to provide total employment, number of employees by job type, age distribution of employees and apprentice/journeymen distributions.

Data collection was by means of a structured questionnaire with pre-defined occupational categories into which employers classified jobs at the time of questionnaire completion. (Appendices 1A and 4 pages 68 and 87.)

This approach was a significant departure from the usual open-ended method used in the Census and the Occupational Employment Survey where jobs were described by respondents or provided in the form of job titles which were subsequently sorted into occupational categories and coded by office processing staff.

Employee Information

The primary objective of the employee questionnaire was to collect data on the educational or training background of persons currently employed in selected occupations. The employee questionnaire also requested data on geographic, occupational and industrial mobility from the same people. Collection was by means of a structured questionnaire (see Appendix 1B, page 73) completed through self-enumeration.

"Demand" data is normally expressed in occupational terms, whereas "supply" data is often expressed in educational or training terms (field of study, degrees, certificates obtained). One of the main problems in manpower forecasting is transforming educational supply into corresponding occupational terms. The purpose of the data on qualifications is to provide that link (transformation matrix) between occupations and education or training.

Once the future requirements for a particular occupation have been forecasted by the model, the implications for education and training programs can be determined using the link provided by the employee questionnaire. (For a more detailed description of the survey methodology and observations, see Appendices 5 and 6, pages 96 and 98.)

IV. SURVEY FINDINGS

Introduction

The mining industry, as defined for this survey, includes six sub-industries: metal mines, coal mines, non-metal mines, quarries and sandpits, services incidental to mining, and smelting and refining. (For a complete description of these sub-industires see the Glossary, Appendix 3, page 84.) It should be noted that the definition developed for the survey was felt to include those companies who would normally identify themselves with the mining industry. This definition is not necessarily comparable to ones used in other reports or by other agencies e.g. in other definitions, petroleum and gas may be included or incidental services and smelting and refining may be excluded.

For the purpose of analysis, the data has been discussed in relationship to these sub-industries with the exception of quarries and sandpits. Although technically considered to be part of the industry, the data collected consistently portrayed this sub-industry as markedly different from the others. The detailed information for sand pits and quarries is, however, included in the Tables.

The data collected in the survey has been used to address four broad topic areas: 1) Total Employment; 2) Distribution of Occupations; 3) Age Structure of the Mining Workforce, and 4) Apprenticeship Training Ratios. These areas have been identified as being of importance to manpower planners and policy makers. Each topic area has, in turn, been scrutinized from a number of perspectives in an attempt to identify any significant similarities/ differences or highlights.

An analysis of the data suggests that industry sector is the most important factor in determining total employment, occupational skills and work force age. The only topic in which a regional disaggregation appeared significant was "Apprenticeship Training Ratios". However, tables containing regional information are included.

Total Employment

Overview

As a first step in data analysis a total industry employment profile was developed. This profile provides a "group snapshot" of the industry and establishes a general reference for analyzing its structure and component parts. Mining industry employment captured by the survey totalled 25,300 or 2% of the province's total employment of 1.2 million persons in 1982.[1] This compares very closely to an employment level of 25,400 tabulated by Statistics Canada in their equivalent establishment survey.[2]

The largest sub-industry in terms of employment is metal mines with 10,450 employees. Copper is the single most important metal in terms of employment in British Columbia with ten establishments accounting for 3,326 employees or one-third of the employment in metal mines. There are eight silver and seven placer gold operations, however, employment levels are fairly low with 466 and 85 employees respectively.

It should also be noted that in British Columbia the majority of operating mines (34 of 55) are open pit. The breakdown by sub-industry is coal mines (4 of 5); metal mines (21 of 39) and non-metal (9 of 11). For additional information on the operating mines referred to in this paragraph see Appendix 2d page 81.

2b. Employment by Establishment Size (Table 2)

The survey results clearly indicate that employment within the industry is dominated by a few relatively large firms. Of the 400 establishments surveyed, the six "large establishments", i.e. those employing over

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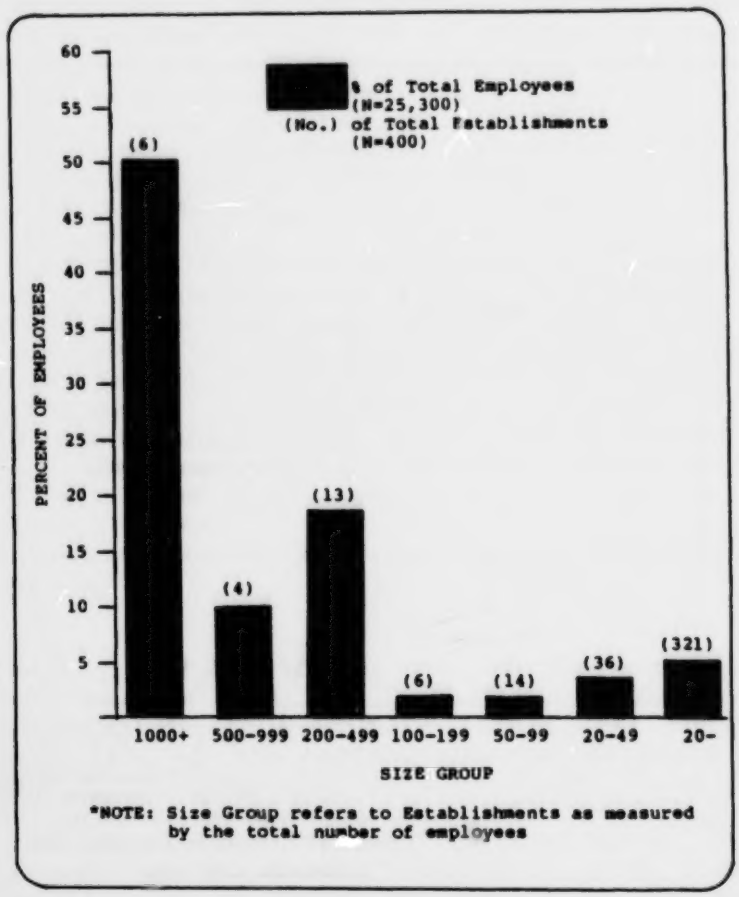
1 Labour Force Survey, Statistics Canada Catalogue Number 72-001 December, 1982.

2 Estimates of Employees by Province and Industry (Statistics Canada Catalogue No. 72.008 Mining Industry) Employment Survey (Statistics Canada Catalogue No. 72-002 Employment In Primary Metals Manufacturing, April, 1982. However, substantial differences exists between an establishment-based survey and the 1981 census data. See Appendix 7, p.99.

1,000 workers, represent 52.8% of the total industry employment. If the 500-999 employee category is included in the "large employer definition" this group accounts for almost two-thirds of the total industry employment. Medium sized establishments (200-499 employees) constitute an additional 19.1% of total industry employment. None of the remaining establishment size categories individually represents more than 5.5% of the industry's employment. (See Figure 2.)

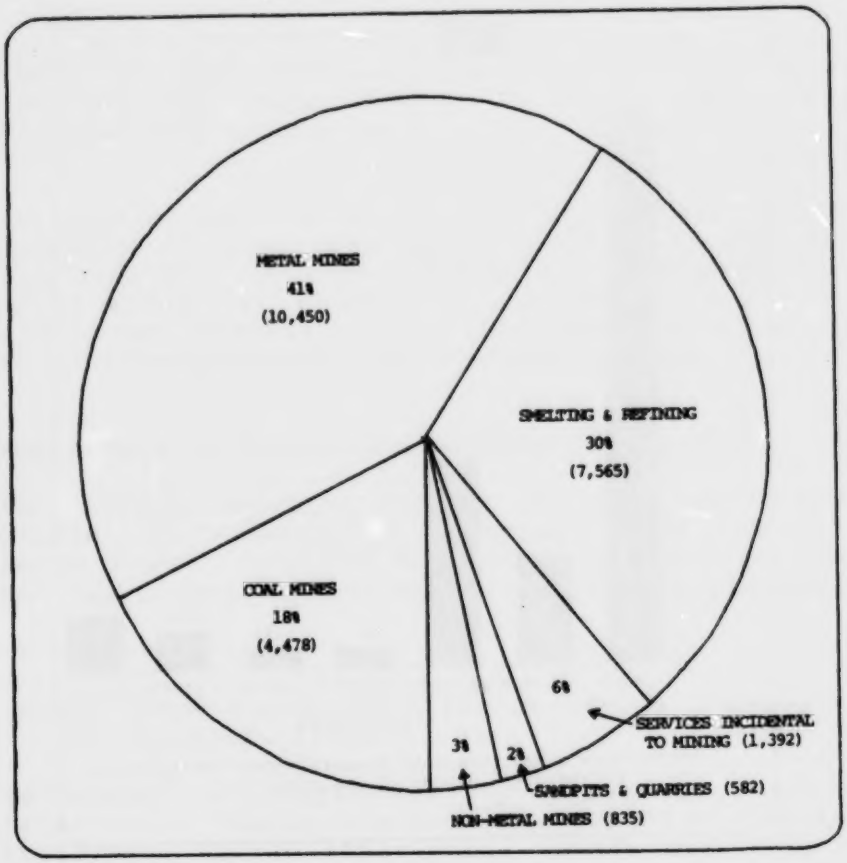
FIGURE 2: PERCENTAGES OF EMPLOYEES AND NUMBER OF ESTABLISHMENTS SURVEYED



Employment by Sub Industry (Table 1)

Within the industry, metal mines are the leading employer with 41.3% of the total industry employment. Smelting and refining is second with 29.9% of the industry employment and coal is a distant third with 17.7%. The remaining three industry sectors collectively account for only 11% of total employment. (See Figure 3.)

FIGURE 3: DISTRIBUTION OF EMPLOYMENT ACROSS THE MINING INDUSTRY



However, it must be noted that within some of these sub industries employment is heavily concentrated among a few large establishments. For example, smelting and refining is represented by seven establishments accounting for close to 30% of the mining industry's total employment, whereas there are approximately 84 metal mining establishments, accounting for 41.3% of the industry's total employment.

Distribution of Occupations

Overview:

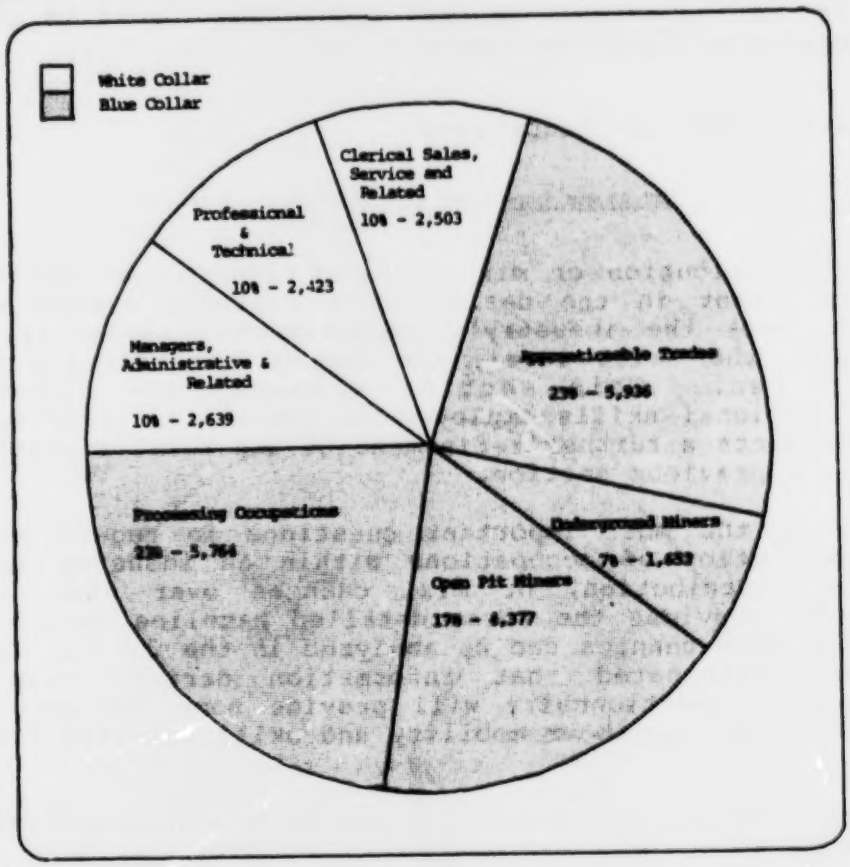
The distribution or mix of occupations is an important determinant in the design of a training system which will meet the industry's requirements; generally, the higher the skill level, the longer the training times required. This section examines the types of occupational skills employed in the mining industry and represents a further refinement of the results presented in the previous section.

One of the most important questions in regard to the distribution of occupations within an industry is how this distribution, or mix, changes over time. The survey provides the first detailed baseline record from which such changes can be analyzed in the future. It is also anticipated that information derived from the employee questionnaire will provide some indication of the change in labour mobility and skill substitution.

Distribution of Occupations Across the Mining Industry (Table 4)

Approximately one-fourth of the mining work force is tradesmen, making them the largest occupational group. This concentration is even more significant considering that only 19% of the establishments surveyed employ tradesmen. The remaining categories of "blue collar" workers represent an additional 46% of total employment. The three broad occupational groups which could be defined as "white collar" workers each represent approximately 10% of total employment or 30% overall. In other words, the mining industry employs three (3) "white collar" workers for every seven (7) "blue collar" workers. (See Figure 4.)

FIGURE 4: DISTRIBUTION OF OCCUPATIONS WITHIN THE MINING INDUSTRY



Distribution of Occupations: Sub Industries (Table 5 & 6)

The survey results indicate that sub industry is a more important factor in determining the distribution of occupations within the industry than establishment size or region. The metal mines, coal and non-metal mining sub industries present a relatively consistent distribution of occupations. Services incidental to mining has a less diverse mix of occupations with the concentration being in the professional-technical category.

In analyzing the distribution of occupations across sub-industries it is again useful to consider the broad groupings of "blue" and "white collar". The "blue collar" occupations are concentrated in three sub industries: metal mining, coal, and smelting and refining, which together account for approximately 92% of total "blue collar" employment, compared to 89% of total employment.

More significant is the concentration of "white collar" workers in the services incidental to mining sub industry. While representing approximately 6% of the total employment in the mining industry, this sub-industry employs 10% of all professionals and 20% of managers, clerical and sales personnel.

With regard to the concentration of specific professional and technical occupations across the sub industries some significant differences are worth noting. Smelting and refining establishments which employ approximately one-third of all professionals, employ more than two-thirds of the chemical, civil and electrical engineers. Not surprisingly, the mining engineers are concentrated in the metal mines sub-industry. Services incidental to mining, while employing approximately one-fifth of all professionals, employs more than one-half of the 320 geologists. This reflects the prevalence of exploration companies in this sub-industry. Of further interest, the survey counted 17 electronic/electrical technicians, 14 of whom work in smelting and refining.

Distribution of Occupations by Establishment Size (Tables 7 & 8)

Although the survey indicates that the type of mining activity is a critical factor in determining the distribution or mix of occupations, establishment size also provides some interesting observations. This is primarily because total employment is so heavily concentrated in a few, relatively large firms.

The three largest categories (200 to 1,000+ employees) demonstrate a relatively uniform distribution of occupations. The three smallest categories, which are

dominated by firms servicing the industry, employ predomonantly "white collar" occupations. Generally speaking, it can be said that throughout the mining industry the smaller the establishment size, the greater the proportion of "white collar" occupations.

Age Structure of the Mining Work Force

Overview

Identifying the age characteristics of the existing work force provides a primary indicator of future supply problems, particularly in light of the lead times required to train highly skilled personnel. If the work force is uniformly "older than average", this usually implies mortality and retirement rates will be an important factor in the manpower planning process.

The age breakout gathered by the survey is a simple headcount of those workers under 55 years and those 55 and over. It was a survey design decision to minimize the burden placed upon the respondent but at the same time to identify the group of workers most likely to have the greatest impact upon the planning process.

The data collected by the survey indicates that approximately 8% of the mining industry's professional, technical and journeymen work force is 55 years and older. Approximately 12% of the total Provincial work force is 55 years and older.[1] While direct comparisons should not be made between these two numbers, the indication is that employees in the mining industry are young relative to the rest of the economy.

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1 Labour Force Survey, 1982 annual average, Statistics Canada Cataloque Number 72-001, December 1982.

EMPLOYMENT BY AGE

OCCUPATION	Total Employment	Employment by Age	
		Under 55	55 and Over
Mining Survey			
Total Professional	1,312	92.8%	7.2%
Total Technical	1,106	92.0%	8.0%
Total Journeymen	4,228	91.7%	8.3%
Labour Force Survey			
1982 Annual Average B.C. Work Force	1,183,000	88.2%	11.8%

Age by Occupation (Tables 9 to 14)

Across the mining industry there is little variation in age among the professional, technical, and trades occupational groups; in general, these occupations appear relatively young having more than 90% under the age of 55. Journeymen tend to be somewhat older than either professionals or technicians, but the difference is not great.

However, these broad occupational groupings only tell part of the story. For example, an examination of occupations shows a range from 0% to 25%, age 55 and over. (This ignores the one anomaly of 33% for telecommunication electricians, which has only three personnel.)

As noted, age is an important factor in manpower planning. The following table provides a listing of occupations where 10% or more of the personnel are 55 years or older.

OCCUPATIONS WITH TEN PERCENT OR MORE OF THE PERSONNEL 55 YEARS OF AGE AND OVER

Occupation	Total Number	Percent 55 and over
Professional:		
Chemical Engineer	39	20
Physical Metallurgist	15	13
Civil Engineer	47	23
Geological Engineer	46	11
Technical:		
Electronic Technician	17	12
Metallurgical/Chem. Tech.	164	14
Mechanical Technician	16	19
Apprenticeable Trades:		
Millwright	782	10
Winder Electrician	16	25
Telecommunication Electrician	3	33
Steel Fabricator	89	11
Carpenter	207	17
Ironworker	52	14
Sheetmetal Worker	14	21
Steam Engineer	37	16
Machinists	187	10

Age by Sub Industry (Tables 9 & 10)

Generally, there is little difference in the age distribution by broad occupational groupings across sub industries. The one possible exception is smelting and refining which displays a marginally older work force in all broad occupational groups, but this may, in fact, be explained by the age of the major establishments which make up this sub industry.

For the industry as a whole, technicians tend to be older as a group than professionals, but this reflects the heavy concentration of employment in the metal mines and smelting and refining sub industries. In the other four sub industries the inverse relationship prevails. This situation may be the result of the particular definition of "technician" used by the metal mines and smelting and refining sub industries. It is hoped that the results of the employee questionnaire will shed some light in this area.

Apprenticeship Training Ratios

Overview

Training ratios are an important indicator for two reasons. First, the ratios provide a measure of the present utilization of training capacity and thus the ability to address projected shortages using conventional training methods. Second, ratios provide a rudimentary measure of future imbalances between the demand for a specific trade and the supply.

When the Critical Trades Survey - Phase II was completed, the training ratio for the mining industry in 1980 was estimated at 1:2.4: that is one apprentice for every 2.4 tradesmen. This is the highest ratio of all industries surveyed during the three phases of the Critical Trades project, which indicates that the mining industry makes a substantial commitment to training. While the Mining Industry Pilot Survey (M.I.P.S.) is not directly comparable to the Critical Trades project, the M.I.P.S ratio of 1:3.1 suggests that this commitment has been maintained. When the M.I.P.S. ratio is compared to other industry ratios, derived from the Critical Trades Project, it still remains the highest.

Training Ratios by Establishment Size (Tables 18 to 19)

It is note worthy to report that of the seventy-five establishments employing journeymen only thirty-seven of them also employed apprentices. Thus only half of the surveyed establishments with journeymen do any training. These results are even more dramatic when examined by firm size.

Training ratios by establishment size clearly demonstrate that the larger firms are the most prolific trainers. The highest ratio (1:2.4) is found in firms with 500-999 employees. Firms with 200-499 employees follow closely with a ratio of 1:3.0 and firms with 1,000 employees - 1:3.1. The lowest ratio (1:22.3) is found for firms with 50-99 employees; however, the number of journeymen employed by firms in this size category is quite small. Clearly, the large firms who employ journeymen also train apprentices but establishment training rates drop off markedly as establishments become smaller. This is undoubtedly due to a wide variety of factors such as costs of training, economies of scale, type of operation, etc. (See the following table)

Establishments Employing Journeymen and their Training Rate[1]

ALL APPRENTICEABLE TRADES

All Establishments		1000+		500-999		200-499		100-199		50-99		20-49		2-19	
Number	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
75	49.3	6	100	4	100	12	100	4	75.0	9	33.3	19	26.3	21	19.0

1 Percent of total establishments with journeymen that employ apprentices.

Training Ratios by Sub Industry (Tables 16 & 17)

An examination of ratios by type of mine operation shows coal and non-metal mines with the highest ratios in the industry with 1:2.6 and 1:2.9, respectively. Both metal mines and smelting and refining have ratios which compare closely, 1:3.3 and 1:3.0, respectively. However, in terms of actual training efforts, both metal mines and smelting and refining have considerably more apprentices, 43% and 30%, of the industry's total. It would appear that, with the exception of the service sub industry, the major characteristic affecting training ratios is establishment size rather than type of mining operation.

Training Ratios by Region (Tables 20 to 21)

The Provincial training ratio for all trades is 1:3.1. Both the North and the Southeast are training at that ratio or better. The Interior follows closely at a rate of 1:3.6. The only region which has a significantly lower training ratio is the Lower Mainland (1:12.8). But an examination of the tables also reveals that far fewer apprentices are employed in this region. This is not surprising as service and head office functions tend to dominate the industry in the Lower Mainland, whereas the training of apprentices, by the very nature of the work involved, is a mine site activity

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and

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TABLE 1
Number of Establishments and Employment By Sub-Industry Group
Mining Industry
April, 1982

Industry	Number of Establishments	Number of Employees
Metal Mines (includes Milling)	**84**	**10,461**
Head Offices and Non-Mining Units	40	607
Mining Units	44	9,854
Placer Gold	7	85
Gold Quartz	6	396
Silver	8	466
Copper	10	3,326
Molybdenum	3	1,162
Copper/Molybdenum	5	2,757
Other Metal Mines	5	1,662
Coal Mines	**7**	**4,469**
Head Offices and Non-Mining Units	3	146
Mining Units	4	4,323
Non-Metal Mines	**15**	**848**
Head Offices and Non-Mining Units	3	46
Mining Units	12	802
Smelting and Refining	**7**	**7,555**
Head Offices and Non-Operating Units	3	312
Operating Units	4	7,243
Quarries and Sand Pits	**62**	**582**
Head Offices and Non-Mining Units	10	23
Mining Units	52	559
Services Incidental to Mining	**225**	**1,387**
ALL INDUSTRIES	**400**	**25,302**

TABLE 2
Number of Establishments and Employment By Size of Establishment
Mining Industry
April, 1982

Size of Establishment	Number of Establishments	Number of Employees
1000 + Employees	6	13,369
500 - 999 Employees	4	2,677
200 - 499 Employees	13	4,839
100 - 199 Employees	6	910
50 - 99 Employees	14	952
20 - 49 Employees	36	1,124
2 - 19 Employees	245	1,355
1 Employee Only	76	76
ALL ESTABLISHMENTS	400	25,302

TABLE 3
Number of Establishments and Employment By Region
Mining Industry
April, 1982

Region	Number of Establishments	Number of Employees
North	61	6,195
Interior	55	4,303
Southeast	39	10,692
Lower Mainland	233	2,678
Vancouver Island	12	1,434
BRITISH COLUMBIA	400	25,302

TABLE 4
Employment by Occupational Category and by Selected Occupations
Mining Industry*
April, 1982

OCCUPATION	NUMBER OF ESTABLISHMENTS WITH EMPLOYEES	NUMBER OF EMPLOYEES
Telecommunications Electricians	4	4
Journeymen	3	3
Apprentices	1	1
Other	-	-
All Other Electricians	38	893
Journeymen	38	640
Apprentices	25	247
Other	2	6
Electronic Technicians	3	16
Journeymen	2	14
Apprentices	2	2
Other	-	-
Instrumentation Mechanics	15	130
Journeymen	13	75
Apprentices	14	52
Other	2	3
Welders	44	658
Journeymen	42	584
Apprentices	11	40
Other	7	34
Steel Fabricators	12	132
Journeymen	10	89
Apprentices	10	43
Other	-	-
Machinists	26	229
Journeymen	26	187
Apprentices	10	41
Other	1	1
Steamfitters/Pipefitters	13	274
Journeymen	13	206
Apprentices	7	68
Other	-	-
Carpenters	25	254
Journeymen	25	207
Apprentices	10	36
Other	3	11
Ironworkers	1	80
Journeymen	1	52
Apprentices	1	28
Other	-	-
Bricklayers	5	39
Journeymen	5	33
Apprentices	3	6
Other	-	-

TABLE 4
Employment by Occupational Category and by Selected Occupations
Mining Industry*
April, 1982

OCCUPATION	NUMBER OF ESTABLISHMENTS WITH EMPLOYEES	NUMBER OF EMPLOYEES
Painters	9	64
Journeymen	9	50
Apprentices	3	11
Other	2	3
Sheet Metal Workers	6	18
Journeymen	5	14
Apprentices	2	4
Other	1	-
Steam Engineers	8	49
Journeymen	7	37
Apprentices	2	4
Other	1	8
Linemen	7	26
Journeymen	7	15
Apprentices	5	11
Other	-	-
Industrial Warehousemen	20	189
Journeymen	7	34
Apprentices	5	49
Other	12	106
Other Apprenticeable Trades	21	238
Journeymen	18	165
Apprentices	4	54
Other	4	19
Underground Mine Workers	**34**	**1,628**
Open Pit Mine Workers	**135**	**4,309**
Processing Occupations	**70**	**5,744**
Other Occupations	**5**	**7**
GRAND TOTAL	400	25,302

TOTAL ESTABLISHMENTS = 400

* Includes SIC 051-099 and 295 (excluding 064 and 096)

TABLE 4
Employment by Occupational Category and by Selected Occupations
Mining Industry*
April, 1982

OCCUPATION	NUMBER OF ESTABLISHMENTS WITH EMPLOYEES	NUMBER OF EMPLOYEES
Managers, Administrative & Related	**314**	**2,785**
Professional & Technical Totals	**161**	**2,418**
Professional Total	**150**	**1,312**
Chemical Engineers	7	39
Chemists	14	28
Metallurgical Engineers	19	95
Physical Metallurgists	8	15
Civil Engineers	13	47
Mechanical Engineers	19	79
Mining Engineers	51	160
Geological Engineers	25	46
Geologists	92	320
Electrical Engineers	10	35
Other Engineers or Scientists	30	91
Systems Analysts/Computer Programmers	20	114
Accountants	67	202
Other Professional Occupations	11	41
Technical Total	**91**	**1,106**
Electronic/Electrical Technicians	5	17
Mining Technicians	27	76
Metallurgical, Process or Chemical Techs.	21	164
Mechanical Technicians	10	16
Environmental Technicians	15	65
Draughtsmen	48	174
Surveyors	31	113
Assayers	36	212
Other Engineering/Science Technicians	25	159
Other Technicians	27	110
Clerical, Sales, Service & Related	**278**	**2,482**
Apprenticeable Trades Total	**76**	**5,929**
Millwrights	40	1,100
Journeymen	39	782
Apprentices	25	265
Other	7	53
Heavy Duty Mechanics	58	1406
Journeymen	57	933
Apprentices	31	393
Other	10	80
Automotive Mechanics	22	109
Journeymen	20	92
Apprentices	8	14
Other	2	3
Winder Electricians	4	21
Journeymen	4	16
Apprentices	4	5
Other	-	-

TABLE 5
Percentage Distribution of Employment by Occupation within Sub-Industries
Mining Industry
April, 1982

OCCUPATION	Total Mining Industry	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
GRAND TOTAL	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Managers, Administrative & Related	**11.00**	**11.28**	**13.49**	**14.03**	**15.98**	**20.62**	**6.67**
Professional & Technical Totals	**9.56**	**8.19**	**6.27**	**6.60**	**1.03**	**26.10**	**11.35**
Professional Total	**5.18**	**4.45**	**3.29**	**3.18**	**.51**	**18.53**	**5.47**
Chemical Engineers	.16	.05	-	-	-	-	.45
Chemists	.11	.15	-	-	.17	.07	.13
Metallurgical Engineers	.38	.52	.11	-	-	-	.48
Physical Metallurgists	.06	.05	-	-	-	.29	.08
Civil Engineers	.19	.02	.18	.24	-	.22	.42
Mechanical Engineers	.31	.16	.31	-	-	.22	.60
Mining Engineers	.63	1.03	.76	.12	-	.65	.11
Geological Engineers	.18	.06	.07	-	-	1.59	.20
Geologists	1.26	.93	.47	.47	-	12.76	.28
Electrical Engineers	.14	.05	.07	.12	-	-	.34
Other Engineers or Scientists	.36	.14	.45	.47	.17	1.00	.49
Systems Analysts/Computer Programmers	.45	.27	.38	.35	-	.07	.86
Accountants	.80	.87	.47	1.17	.17	1.66	.74
Other Professional Occupations	.15	.15	.02	.24	-	-	.29
Technical Total	**4.38**	**3.74**	**2.98**	**3.42**	**.52**	**7.57**	**5.88**
Electronic/Electrical Technicians	.07	.01	-	-	-	.14	.18
Mining Technicians	.30	.48	.20	.12	-	1.15	-
Metallurgical, Process or Chemical Techs.	.65	.45	.16	-	-	.14	1.43
Mechanical Technicians	.06	.05	.02	.12	-	.29	.07
Environmental Technicians	.26	.12	.22	.24	-	.07	.52
Draughtsmen	.69	.34	.34	.59	-	1.80	1.23
Surveyors	.45	.76	.38	.35	-	.14	.15
Assayers	.84	1.06	.29	1.17	-	.43	.95
Other Engineering/Science Technicians	.63	.30	1.12	.59	-	2.32	.54
Other Technicians	.43	.17	.25	.24	.52	1.09	.81
Clerical, Sales, Service & Related	**9.81**	**8.94**	**9.13**	**17.81**	**11.68**	**18.96**	**8.70**

TABLE 5
Percentage Distribution of Employment by Occupation within Sub-Industries
Mining Industry
April, 1982

OCCUPATION	Total Mining Industry	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Apprenticeable Trades Total	**23.43**	**27.11**	**26.56**	**20.52**	**7.91**	**2.74**	**21.81**
Millwrights	4.35	6.25	2.73	3.77	.69	.07	3.80
Journeymen	3.09	4.40	2.06	2.83	.69	.07	2.66
Apprentices	1.05	1.35	.67	.94	-	-	1.14
Other	.21	.50	-	-	-	-	-
Heavy Duty Mechanics	5.56	7.58	9.38	6.13	4.12	1.60	1.27
Journeymen	3.69	4.88	6.13	4.36	3.26	1.38	.97
Apprentices	1.55	1.93	3.24	1.77	.86	.22	.30
Other	.32	.77	-	-	-	-	-
Automotive Mechanics	.43	.70	.76	.12	.17	-	-
Journeymen	.36	.57	.67	.12	.17	-	-
Apprentices	.06	.10	.09	-	-	-	-
Other	.01	.03	-	-	-	-	-
Winder Electricians	.08	.06	-	-	-	-	.20
Journeymen	.06	.04	-	-	-	-	.16
Apprentices	.02	.02	-	-	-	-	.04
Other	-	-	-	-	-	-	-
Telecommunications Electricians	.02	.04	-	-	-	-	-
Journeymen	.01	.03	-	-	-	-	-
Apprentices	.01	.01	-	-	-	-	-
Other	-	-	-	-	-	-	-
All Other Electricians	3.53	4.01	4.00	2.48	.52	.07	3.56
Journeymen	2.53	2.81	2.86	1.77	.52	.07	2.63
Apprentices	.98	1.15	1.14	.71	-	-	.93
Other	.02	.05	-	-	-	-	-
Electronic Technicians	.06	-	.13	-	-	.65	.01
Journeymen	.05	-	.13	-	-	.58	-
Apprentices	.01	-	-	-	-	.07	.01
Other	-	-	-	-	-	-	-

TABLE 5
Percentage Distribution of Employment by Occupation within Sub-Industries
Mining Industry
April, 1982

OCCUPATION	Total Mining Industry	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Instrumentation Mechanics	.51	.61	.20	-	-	-	.75
Journeymen	.30	.37	.11	-	-	-	.41
Apprentices	.21	.21	.09	-	-	-	.34
Other	.01	.03	-	-	-	-	-
Welders	2.60	3.01	4.05	2.00	2.41	.07	1.72
Journeymen	2.31	2.65	3.51	1.30	2.41	.07	1.63
Apprentices	.16	.06	.54	.35	-	-	.09
Other	.13	.30	-	.35	-	-	-
Steel Fabricators	.52	.33	.18	1.30	-	-	1.03
Journeymen	.35	.16	.13	.83	-	-	.78
Apprentices	.17	.17	.05	.47	-	-	.25
Other	-	-	-	-	-	-	-
Machinists	.91	.77	.76	.24	-	.14	1.45
Journeymen	.74	.65	.67	.24	-	.14	1.11
Apprentices	.16	.11	.09	-	-	-	.34
Other	.01	.01	-	-	-	-	-
Steamfitters/Pipefitters	1.08	.54	.63	-	-	-	2.50
Journeymen	.81	.39	.40	-	-	-	1.95
Apprentices	.27	.15	.23	-	-	-	.55
Other	-	-	-	-	-	-	-
Carpenters	1.00	.92	.63	1.65	-	-	1.54
Journeymen	.82	.72	.47	1.41	-	-	1.30
Apprentices	.14	.09	.16	.24	-	-	.24
Other	.04	.11	-	-	-	-	-
Ironworkers	.32	-	-	-	-	-	1.06
Journeymen	.21	-	-	-	-	-	.69
Apprentices	.11	-	-	-	-	-	.37
Other	-	-	-	-	-	-	-

TABLE 5
Percentage Distribution of Employment by Occupation within Sub-Industries
Mining Industry
April, 1982

OCCUPATION	Total Mining Industry	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Bricklayers	.15	.06	.04	-	-	-	.41
Journeymen	.13	.04	.04	-	-	-	.36
Apprentices	.02	.02	-	-	-	-	.05
Other	-	-	-	-	-	-	-
Painters	.25	.15	.07	.24	-	-	.57
Journeymen	.19	.11	.04	.24	-	-	.45
Apprentices	.05	.01	.03	-	-	-	.12
Other	.01	.03	-	-	-	-	-
Sheet Metal Workers	.07	.04	.11	.47	-	-	.07
Journeymen	.06	.03	.04	.47	-	-	.07
Apprentices	.01	.01	.07	-	-	-	-
Other	-	-	-	-	-	-	-
Steam Engineers	.19	.33	.11	.59	-	-	.07
Journeymen	.15	.23	.11	.35	-	-	.07
Apprentices	.01	.02	-	.24	-	-	-
Other	.03	.08	-	-	-	-	-
Linemen	.10	.06	.31	-	-	-	.08
Journeymen	.06	.05	.16	-	-	-	.04
Apprentices	.04	.01	.15	-	-	-	.04
Other	-	-	-	-	-	-	-
Industrial Warehousemen	.75	1.02	1.81	.12	-	-	-
Journeymen	.14	.12	.47	-	-	-	-
Apprentices	.19	.20	.62	-	-	-	-
Other	.42	.70	.72	.12	-	-	-
Other Apprenticeable Trades	.94	.62	.65	1.41	-	.14	1.72
Journeymen	.65	.43	.65	1.06	-	.07	1.07
Apprentices	.21	.01	-	.35	-	.07	.65
Other	.07	.18	-	-	-	-	-

TABLE 5
Percentage Distribution of Employment by Occupation within Sub-Industries
Mining Industry
April, 1982

OCCUPATION	Total Mining Industry	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Underground Mine Workers	6.43	11.80	5.82	.12	-	9.59	-
Open Pit Mine Workers	17.03	19.37	32.62	27.71	52.23	20.62	-
Processing Occupations	22.70	13.30	6.04	13.21	11.17	1.23	51.46
Other Occupations	.03	.01	.07	-	-	.14	.01

TABLE 6
Percentage Distribution of Employment across Sub-Industries by Occupation
Mining Industry
April, 1982

OCCUPATION	All Industries	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Total Employees	PERCENT OF TOTAL EMPLOYEES					
GRAND TOTAL	**25,302**	**41.3**	**17.7**	**3.3**	**2.3**	**5.5**	**29.9**
Managers, Administrative & Related	**2,785**	**42.4**	**21.6**	**4.3**	**3.3**	**10.3**	**18.1**
Professional & Technical Totals	**2,418**	**35.4**	**11.6**	**2.3**	**0.2**	**15.0**	**35.5**
Professional Total	**1,312**	**35.4**	**11.2**	**2.1**	**0.2**	**19.6**	**31.5**
Chemical Engineers	39	12.8	-	-	-	-	87.2
Chemists	28	57.1	-	-	3.6	3.6	35.7
Metallurgical Engineers	95	56.8	5.3	-	-	-	37.9
Physical Metallurgists	15	33.3	-	-	-	26.7	40.0
Civil Engineers	47	4.2	17.0	4.3	-	6.4	68.1
Mechanical Engineers	79	21.5	17.7	-	-	3.8	57.0
Mining Engineers	160	67.5	21.3	0.6	-	5.6	5.0
Geological Engineers	46	13.0	6.5	-	-	47.8	32.7
Geologists	320	30.3	6.6	1.2	-	55.3	6.6
Electrical Engineers	35	14.3	8.6	2.9	-	-	74.2
Other Engineers or Scientists	91	16.5	22.0	4.4	1.1	15.4	40.6
Systems Analysts/Computer Programmers	114	24.6	14.9	2.6	-	0.9	57.0
Accountants	202	45.0	10.4	5.0	0.5	11.4	27.7
Other Professional Occupations	41	39.0	2.4	4.9	-	-	53.7
Technical Total	**1,106**	**35.4**	**12.0**	**2.6**	**0.3**	**9.5**	**40.2**
Electronic/Electrical Technicians	17	5.9	-	-	-	11.8	82.3
Mining Technicians	76	65.8	11.8	1.4	-	21.0	-
Metallurgical, Process or Chemical Techs	164	28.7	4.3	-	-	1.2	65.8
Mechanical Technicians	16	31.2	6.3	6.3	-	25.0	31.2
Environmental Technicians	65	20.0	15.4	3.1	-	1.5	60.0
Draughtsmen	174	20.7	8.6	2.9	-	14.4	53.4
Surveyors	113	70.8	15.0	2.7	-	1.8	9.7
Assayers	212	52.3	6.1	4.7	-	2.8	34.1
Other Engineering/Science Technicians	159	19.5	31.4	3.1	-	20.1	25.9
Other Technicians	110	16.4	10.0	1.8	2.7	13.6	55.5
Clerical, Sales, Service & Related	**2,482**	**37.7**	**16.4**	**6.1**	**2.7**	**10.6**	**26.5**

TABLE 6
Percentage Distribution of Employment across Sub-Industries by Occupation
Mining Industry
April, 1982

OCCUPATION	All Industries	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Total Employees	PERCENT OF TOTAL EMPLOYEES					
Apprenticeable Trades Total	**5,929**	**47.8**	**20.1**	**2.9**	**0.8**	**0.6**	**27.8**
Millwrights	1,100	59.4	11.1	2.9	0.4	0.1	26.1
Journeymen	782	58.8	11.8	3.1	0.5	0.1	25.7
Apprentices	265	53.2	11.3	3.1	-	-	32.4
Other	53	100.0	-	-	-	-	-
Heavy Duty Mechanics	1,406	56.4	29.8	3.7	1.7	1.6	6.8
Journeymen	933	54.8	29.4	4.0	2.0	2.0	7.8
Apprentices	393	51.4	36.9	3.8	1.3	0.8	5.8
Other	80	100.0	-	-	-	-	-
Automotive Mechanics	109	67.0	31.2	0.9	0.9	-	-
Journeymen	92	65.2	32.6	1.1	1.1	-	-
Apprentices	14	71.4	28.6	-	-	-	-
Other	3	100.0	-	-	-	-	-
Winder Electricians	21	28.6	-	-	-	-	71.4
Journeymen	16	25.0	-	-	-	-	75.0
Apprentices	5	40.0	-	-	-	-	60.0
Other	-	-	-	-	-	-	-
Telecommunications Electricians	4	100.0	-	-	-	-	-
Journeymen	3	100.0	-	-	-	-	-
Apprentices	1	100.0	-	-	-	-	-
Other	-	-	-	-	-	-	-
All Other Electricians	893	47.1	20.0	2.3	0.4	0.1	30.1
Journeymen	640	45.9	20.0	2.3	0.5	0.1	31.1
Apprentices	247	48.6	20.6	2.4	-	-	28.3
Other	6	100.0	-	-	-	-	-
Electronic Technicians	16	-	37.5	-	-	56.2	6.3
Journeymen	14	-	42.9	-	-	57.1	-
Apprentices	2	-	-	-	-	50.0	50.0
Other	-	-	-	-	-	-	-

TABLE 6
Percentage Distribution of Employment across Sub-Industries by Occupation
Mining Industry
April, 1982

OCCUPATION	All Industries	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Total Employees	PERCENT OF TOTAL EMPLOYEES					
Instrumentation Mechanics	130	49.2	6.9	-	-	-	43.9
Journeymen	75	52.0	6.7	-	-	-	41.3
Apprentices	52	42.3	7.7	-	-	-	50.0
Other	3	100.0	-	-	-	-	-
Welders	658	47.9	27.5	2.6	2.1	0.2	19.7
Journeyman	584	47.6	26.9	1.9	2.4	0.2	21.1
Apprentices	40	15.0	60.0	7.5	-	-	17.5
Other	34	91.2	-	8.8	-	-	-
Steel Fabricators	132	26.5	6.1	8.3	-	-	59.1
Journeymen	89	19.1	6.7	7.9	-	-	66.3
Apprentices	43	41.9	4.6	9.3	-	-	44.2
Other	-	-	-	-	-	-	-
Machinists	229	35.4	14.8	0.9	-	0.9	48.0
Journeymen	187	36.9	16.0	1.1	-	1.1	44.9
Apprentices	41	26.8	9.8	-	-	-	63.4
Other	1	100.0	-	-	-	-	-
Steamfitters/Pipefitters	274	20.8	10.2	-	-	-	69.0
Journeymen	206	19.9	8.7	-	-	-	71.3
Apprentices	68	23.5	14.7	-	-	-	61.8
Other	-	-	-	-	-	-	-
Carpenters	254	37.8	11.0	5.5	-	-	45.7
Journeymen	207	36.7	10.1	5.8	-	-	47.3
Apprentices	36	25.0	19.5	5.5	-	-	50.0
Other	11	100.0	-	-	-	-	-
Ironworkers	80	-	-	-	-	-	100.0
Journeymen	52	-	-	-	-	-	100.0
Apprentices	28	-	-	-	-	-	100.0
Other	-	-	-	-	-	-	-

TABLE 6
Percentage Distribution of Employment across Sub-Industries by Occupation
Mining Industry
April, 1982

OCCUPATION	All Industries	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Total Employees	PERCENT OF TOTAL EMPLOYEES					
Bricklayers	39	15.4	5.1	-	-	-	79.5
Journeymen	33	12.1	6.1	-	-	-	81.8
Apprentices	6	33.3	-	-	-	-	66.7
Other	-	-	-	-	-	-	-
Painters	64	25.0	4.7	3.1	-	-	67.2
Journeymen	50	24.0	4.0	4.0	-	-	68.0
Apprentices	11	9.1	9.1	-	-	-	81.8
Other	3	100.0	-	-	-	-	-
Sheet Metal Workers	18	22.2	27.8	22.2	-	-	27.8
Journeymen	14	21.4	14.3	28.6	-	-	35.7
Apprentices	4	25.0	75.0	-	-	-	-
Other	-	-	-	-	-	-	-
Steam Engineers	49	69.4	10.2	10.2	-	-	10.2
Journeymen	37	64.9	13.5	8.1	-	-	13.5
Apprentices	4	50.0	-	50.0	-	-	-
Other	8	100.0	-	-	-	-	-
Linemen	26	23.1	53.8	-	-	-	23.1
Journeymen	15	33.3	46.7	-	-	-	20.0
Apprentices	11	9.1	63.6	-	-	-	27.3
Other	-	-	-	-	-	-	-
Industrial Warehousemen	189	56.6	42.9	0.5	-	-	-
Journeymen	34	38.2	61.8	-	-	-	-
Apprentices	49	42.8	57.2	-	-	-	-
Other	106	68.9	30.2	0.9	-	-	-
Other Apprenticeable Trades	238	27.3	12.2	5.0	-	0.8	54.6
Journeymen	165	27.3	17.6	5.5	-	0.6	49.1
Apprentices	54	1.9	-	5.6	-	1.9	90.7
Other	19	100.0	-	-	-	-	-

TABLE 6
Percentage Distribution of Employment across Sub-Industries by Occupation
Mining Industry
April, 1982

OCCUPATION	All Industries	Metal Mines	Coal	Non-Metal Mining	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
	Total Employees	PERCENT OF TOTAL EMPLOYEES					
Underground Mine Workers	1,628	75.8	16.0	0.1	-	8.1	-
Open Pit Mine Workers	4,309	47.0	33.8	5.4	7.1	6.7	-
Processing Occupations	5,744	24.2	4.7	1.9	1.1	0.4	67.7
Other Occupations	7	14.3	42.8	-	-	28.6	14.3
TOTAL ESTABLISHMENTS	400	21.0	1.8	3.7	15.5	56.2	1.8

TABLE 7

Percentage Distribution of Employment by Occupation within Establishment Size Group
Mining Industry
April, 1982

OCCUPATION	Percentage of Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT WITHIN SIZE GROUP							
GRAND TOTAL	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Managers, Administrative & Related	**11.00**	***7.88**	**11.32**	**12.40**	**18.57**	**14.08**	**14.59**	**23.62**	**53.95**
Professional & Technical Totals	**9.56**	**7.84**	**6.05**	**9.28**	**14.73**	**12.08**	**19.13**	**21.18**	**10.53**
Professional Total	**5.18**	**3.44**	**2.69**	**5.17**	**9.78**	**7.88**	**13.52**	**15.35**	**9.22**
Chemical Engineers	.16	.26	-	.04	-	.10	-	.07	-
Chemists	.11	.09	.04	.27	-	-	.18	-	-
Metallurgical Engineers	.38	.33	.52	.52	1.10	.10	.09	-	-
Physical Metallurgists	.06	.04	.04	.08	-	.10	.09	.22	-
Civil Engineers	.19	.25	.04	.08	-	.10	.36	.22	-
Mechanical Engineers	.31	.43	.15	.12	.33	.32	.36	.15	-
Mining Engineers	.63	.43	.75	.78	1.10	1.47	.89	.74	1.32
Geological Engineers	.18	.01	.07	.31	.22	-	.71	1.25	1.32
Geologists	1.26	.15	.30	.81	.88	2.21	7.74	9.89	3.95
Electrical Engineers	.14	.22	.07	.04	-	-	-	.07	-
Other Engineers or Scientists	.36	.38	.15	.21	-	.53	.80	.74	2.63
Systems Analysts/Computer Programmers	.45	.57	.11	.27	1.75	.32	.27	-	-
Accountants	.80	.16	.41	1.47	2.75	2.63	1.96	1.99	-
Other Professional Occupations	.15	.12	.04	.16	1.65	-	.09	-	-
Technical Total	**4.38**	**4.40**	**3.36**	**4.11**	**4.95**	**4.20**	**5.60**	**5.83**	**1.31**
Electronic/Electrical Technicians	.07	.11	-	-	.11	-	.18	-	-
Mining Technicians	.30	.19	.30	.27	.55	.21	.98	.81	-
Metallurgical, Process or Chemical Techs.	.65	.97	.15	.33	.66	.84	-	-	-
Mechanical Technicians	.06	.04	.07	.08	.11	.10	-	.22	-
Environmental Technicians	.26	.37	.34	.10	.11	.10	-	.07	-
Draughtsmen	.69	.79	.30	.23	.66	.95	1.24	1.48	-
Surveyors	.45	.28	.60	.78	.99	.84	.36	-	-
Assayers	.84	.55	1.23	1.59	.77	.74	.98	.22	-
Other Engineering/Science Technicians	.63	.64	.22	.45	.55	.32	.89	1.92	1.31
Other Technicians	.43	.46	.15	.27	.44	.10	.98	1.11	-
Clerical, Sales, Service & Related	**9.81**	**7.36**	**9.00**	**8.82**	**19.78**	**17.96**	**16.28**	**20.37**	**26.32**

*7.88% of all employees within establishment size group 1000+ are in the Managers, Administrative and Related category

TABLE 7
Percentage Distribution of Employment by Occupation within Establishment Size Group
Mining Industry
April, 1982

OCCUPATION	Percentage of Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT WITHIN SIZE GROUP							
Apprenticeable Trades Total	**23.43**	**25.74**	**32.91**	**26.37**	**13.85**	**10.08**	**6.14**	**2.95**	**-**
Millwrights	4.35	4.29	7.06	5.54	2.53	3.47	.98	.15	-
Journeymen	3.09	3.21	3.77	3.95	1.98	3.36	.80	.15	-
Apprentices	1.05	1.06	2.13	1.24	.55	.11	-	-	-
Other	.21	.02	1.16	.35	-	-	.18	-	-
Heavy Duty Mechanics	5.56	4.78	10.09	7.75	4.83	2.41	3.47	1.18	-
Journeymen	3.69	3.31	5.79	4.85	3.51	2.31	2.76	1.11	-
Apprentices	1.55	1.35	3.40	2.07	1.32	.10	.62	.07	-
Other	.32	.12	.90	.83	-	-	.09	-	-
Automotive Mechanics	.43	.28	1.16	.68	.44	.10	.18	.07	-
Journeymen	.36	.25	.93	.56	.44	.10	.09	.07	-
Apprentices	.06	.03	.16	.12	-	-	-	-	-
Other	.01	-	.07	-	-	-	.09	-	-
Winder Electricians	.08	.16	-	-	-	-	-	-	-
Journeymen	.06	.12	-	-	-	-	-	-	-
Apprentices	.02	.04	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Telecommunications Electricians	.02	-	.07	.02	-	-	.09	-	-
Journeymen	.01	-	.04	.02	-	-	.09	-	-
Apprentices	.01	-	.03	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
All Other Electricians	3.53	4.05	4.30	4.15	1.65	1.58	.44	.07	-
Journeymen	2.53	3.01	2.66	2.81	1.32	1.47	.35	.07	-
Apprentices	.98	1.04	1.57	1.26	.33	.11	.09	-	-
Other	.02	-	.07	.08	-	-	-	-	-
Electronic Technicians	.06	.05	-	-	-	-	-	.66	-
Journeymen	.05	.04	-	-	-	-	-	.59	-
Apprentices	.01	.01	-	-	-	-	-	.07	-
Other	-	-	-	-	-	-	-	-	-

TABLE 7
Percentage Distribution of Employment by Occupation within Establishment Size Group
Mining Industry
April, 1982

OCCUPATION	Percentage of Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT WITHIN SIZE GROUP %							
Instrumentation Mechanics	.52	.70	.48	.48	-	-	-	-	-
Journeymen	.30	.40	.37	.25	-	-	-	-	-
Apprentices	.21	.29	.11	.21	-	-	-	-	-
Other	.01	.01	-	.02	-	-	-	-	-
Welders	2.60	2.80	4.07	2.77	1.43	1.26	.80	.52	-
Journeymen	2.31	2.54	3.47	2.40	1.32	1.26	.53	.45	-
Apprentices	.16	.21	.07	.16	.11	-	-	.07	-
Other	.13	.05	.53	.21	-	-	.27	-	-
Steel Fabricators	.52	.76	.97	.06	.22	-	-	-	-
Journeymen	.35	.57	.37	.02	.22	-	-	-	-
Apprentices	.17	.19	.60	.04	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Machinists	.91	1.38	.71	.41	.22	.21	-	.07	-
Journeymen	.74	1.12	.56	.35	.22	.21	-	.07	-
Apprentices	.16	.26	.11	.06	-	-	-	-	-
Other	.01	-	.04	-	-	-	-	-	-
Steamfitters/Pipefitters	1.08	1.91	.07	.33	-	-	-	-	-
Journeymen	.81	1.44	.07	.23	-	-	-	-	-
Apprentices	.27	.47	-	.10	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Carpenters	1.00	1.23	1.42	.70	1.21	.63	-	-	-
Journeymen	.82	1.03	.90	.60	1.10	.63	-	-	-
Apprentices	.14	.20	.15	.08	.11	-	-	-	-
Other	.04	-	.37	.02	-	-	-	-	-
Ironworkers	.32	.60	-	-	-	-	-	-	-
Journeymen	.21	.39	-	-	-	-	-	-	-
Apprentices	.11	.21	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-

TABLE 7
Percentage Distribution of Employment by Occupation within Establishment Size Group
Mining Industry
April, 1982

OCCUPATION	Percentage of Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT WITHIN SIZE GROUP							
Bricklayers	.15	.27	-	.06	-	-	-	-	-
Journeymen	.13	.24	-	.02	-	-	-	-	-
Apprentices	.02	.03	-	.04	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Painters	.25	.39	.37	.04	-	-	-	-	-
Journeymen	.19	.31	.26	.04	-	-	-	-	-
Apprentices	.05	.08	-	-	-	-	-	-	-
Other	.01	-	.11	-	-	-	-	-	-
Sheet Metal Workers	.07	.07	.19	.06	-	-	-	-	-
Journeymen	.05	.05	.19	.04	-	-	-	-	-
Apprentices	.02	.02	-	.02	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Steam Engineers	.19	.07	.19	.56	.77	-	-	-	-
Journeymen	.15	.07	.12	.39	.55	-	-	-	-
Apprentices	.01	-	.07	-	.22	-	-	-	-
Other	.03	-	-	.17	-	-	-	-	-
Linemen	.10	.17	.07	.02	-	-	-	-	-
Journeymen	.06	.10	.04	.02	-	-	-	-	-
Apprentices	.04	.07	.03	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Industrial Warehousemen	.75	.64	.71	1.65	.11	.10	.09	.07	-
Journeymen	.14	.10	-	.41	-	-	-	.07	-
Apprentices	.19	.16	-	.56	-	-	-	-	-
Other	.42	.38	.71	.68	.11	.10	.09	-	-
Other Apprenticeable Trades	.94	1.13	.97	1.07	.44	.32	.09	.15	-
Journeymen	.65	.69	.64	.99	.44	.21	.09	.07	-
Apprentices	.21	.37	.11	-	-	.11	-	.08	-
Other	.08	.07	.22	.08	-	-	-	-	-

TABLE 7
Percentage Distribution of Employment by Occupation within Establishment Size Group
Mining Industry
April, 1982

OCCUPATION	Percentage of Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT WITHIN SIZE GROUP							
Underground Mine Workers	6.43	6.00	-	7.07	13.96	21.32	9.70	3.10	3.95
Open Pit Mine Workers	17.03	11.50	28.50	23.89	9.34	16.39	24.64	24.50	2.63
Processing Occupations	22.70	33.64	12.22	12.17	9.78	8.09	9.43	4.13	2.63
Other Occupations	.03	.03	-	-	-	-	.09	.15	-

TABLE 8
Percentage Distribution of Employment across Establishment Size Groups by Occupation
Mining Industry
April, 1982

OCCUPATION	Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT OF EMPLOYEES							
GRAND TOTAL	**25,302**	**52.8**	**10.6**	**19.2**	**3.6**	**3.8**	**4.4**	**5.3**	**0.3**
Managers, Administrative & Related	**2,785**	* **37.8**	**10.9**	**21.5**	**6.1**	**4.8**	**5.9**	**11.5**	**1.5**
Professional & Technical Totals	**2,418**	**43.3**	**6.7**	**18.6**	**5.5**	**4.8**	**8.9**	**11.9**	**0.3**
Professional Total	**1,312**	**35.0**	**5.5**	**19.1**	**6.8**	**5.7**	**11.6**	**15.9**	**0.5**
Chemical Engineers	39	89.7	-	5.1	-	2.6	-	2.6	-
Chemists	28	42.9	3.6	46.4	-	-	7.1	-	-
Metallurgical Engineers	95	46.3	14.7	26.3	10.5	1.1	1.1	-	-
Physical Metallurgists	15	33.3	6.7	26.7	-	6.7	6.7	20.0	-
Civil Engineers	47	72.3	2.1	8.5	-	2.1	8.5	6.4	-
Mechanical Engineers	79	72.1	5.1	7.6	3.8	3.8	5.1	2.5	-
Mining Engineers	160	35.6	12.5	23.8	6.2	8.8	6.2	6.2	0.6
Geological Engineers	46	2.2	4.3	32.6	4.3	-	17.4	37.0	2.2
Geologists	320	6.2	2.5	12.2	2.5	6.6	27.2	41.9	0.9
Electrical Engineers	35	85.7	5.7	5.7	-	-	-	2.9	-
Other Engineers or Scientists	91	56.0	4.4	11.0	-	5.5	9.9	11.0	2.2
Systems Analysts/Computer Programmers	114	66.7	2.6	11.4	14.0	2.6	2.6	-	-
Accountants	202	10.4	5.4	35.1	12.4	12.4	10.9	13.4	-
Other Professional Occupations	41	39.0	2.4	19.5	36.6	-	2.4	-	-
Technical Total	**1,106**	**53.2**	**8.1**	**18.0**	**4.1**	**3.6**	**5.7**	**7.1**	**0.1**
Electronic/Electrical Technicians	17	82.3	-	-	5.9	-	11.8	-	-
Mining Technicians	76	34.2	10.5	17.1	6.6	2.6	14.5	14.5	-
Metallurgical, Process or Chemical Techs.	164	79.3	2.4	9.8	3.7	4.9	-	-	-
Mechanical Technicians	16	31.2	12.5	25.0	6.2	6.2	-	18.8	-
Environmental Technicians	65	73.8	13.8	7.7	1.5	1.5	-	1.5	-
Draughtsmen	174	60.9	4.6	6.3	3.4	5.2	8.0	11.5	-
Surveyors	113	33.6	14.1	33.6	8.0	7.1	3.5	-	-
Assayers	212	34.9	15.6	36.3	3.3	3.3	5.2	1.4	-
Other Engineering/Science Technicians	159	54.1	3.8	13.8	3.1	1.9	6.3	16.3	0.6
Other Technicians	110	56.4	3.6	11.8	3.6	0.9	10.0	13.6	-
Clerical, Sales, Service & Related	**2,482**	**39.6**	**9.7**	**17.2**	**7.2**	**6.9**	**7.4**	**11.1**	**0.8**

* 37.8% of all employees in the Managers, Administrative and Related category, are employed in establishments of 1000 or more employees

TABLE 8
Percentage Distribution of Employment across Establishment Size Groups by Occupation
Mining Industry
April, 1982

OCCUPATION	Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT OF EMPLOYEES							
Apprenticeable Trades Total	**5,929**	**58.0**	**14.9**	**21.5**	**2.1**	**1.6**	**1.2**	**0.7**	**-**
Millwrights	1,100	52.2	17.2	24.4	2.1	3.0	1.0	0.2	-
Journeymen	782	54.8	12.9	24.4	2.3	4.1	1.1	0.3	-
Apprentices	265	53.6	21.5	22.6	1.9	0.4	-	-	-
Other	53	5.7	58.4	32.1	-	-	3.8	-	-
Heavy Duty Mechanics	1,406	45.4	19.2	26.7	3.1	1.6	2.8	1.1	-
Journeymen	933	47.5	16.6	25.2	3.4	2.4	3.3	1.6	-
Apprentices	393	46.1	23.2	25.4	3.1	0.2	1.8	0.2	-
Other	80	18.7	30.0	50.0	-	-	1.3	-	-
Automotive Mechanics	109	33.9	28.4	30.3	3.7	0.9	1.8	0.9	-
Journeymen	92	35.9	27.2	29.3	4.3	1.1	1.1	1.1	-
Apprentices	14	28.6	28.6	42.8	-	-	-	-	-
Other	3	-	66.7	-	-	-	33.3	-	-
Winder Electricians	21	100.0	-	-	-	-	-	-	-
Journeymen	16	100.0	-	-	-	-	-	-	-
Apprentices	5	100.0	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Telecommunications Electricians	4	-	50.0	25.0	-	-	25.0	-	-
Journeymen	3	-	33.4	33.3	-	-	33.3	-	-
Apprentices	1	-	100.0	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
All Other Electricians	893	60.6	12.9	22.5	1.7	1.7	0.6	0.1	-
Journeymen	640	62.8	11.1	21.2	1.9	2.2	0.6	0.2	-
Apprentices	247	56.3	17.0	24.7	1.2	0.4	0.4	-	-
Other	6	-	33.3	66.7	-	-	-	-	-
Electronic Technicians	16	43.8	-	-	-	-	-	56.2	-
Journeymen	14	42.9	-	-	-	-	-	57.1	-
Apprentices	2	50.0	-	-	-	-	-	50.0	-
Other	-	-	-	-	-	-	-	-	-

TABLE 8
Percentage Distribution of Employment across Establishment Size Groups by Occupation
Mining Industry
April, 1982

OCCUPATION	Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT OF EMPLOYMENT							
Bricklayers	39	92.3	-	7.7	-	-	-	-	-
Journeymen	33	97.0	-	3.0	-	-	-	-	-
Apprentices	6	66.7	-	33.3	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Painters	64	81.2	15.6	3.1	-	-	-	-	-
Journeymen	50	82.0	14.0	4.0	-	-	-	-	-
Apprentices	11	100.0	-	-	-	-	-	-	-
Other	3	-	100.0	-	-	-	-	-	-
Sheet Metal Workers	18	55.6	27.8	16.7	-	-	-	-	-
Journeymen	14	50.0	35.7	14.3	-	-	-	-	-
Apprentices	4	75.0	-	25.0	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Steam Engineers	49	20.4	10.2	55.1	14.3	-	-	-	-
Journeymen	37	27.0	8.1	51.4	13.5	-	-	-	-
Apprentices	4	-	50.0	-	50.0	-	-	-	-
Other	8	-	-	100.0	-	-	-	-	-
Linemen	26	88.5	7.7	3.8	-	-	-	-	-
Journeymen	15	86.6	6.7	6.7	-	-	-	-	-
Apprentices	11	90.9	9.1	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Industrial Warehousemen	189	45.5	10.1	42.4	0.5	0.5	0.5	0.5	-
Journeymen	34	38.3	-	58.8	-	-	-	2.9	-
Apprentices	49	44.9	-	55.1	-	-	-	-	-
Other	106	48.2	17.9	31.2	0.9	0.9	0.9	-	-
Other Apprenticeable Trades	238	63.0	10.9	21.8	1.7	1.3	0.4	0.8	-
Journeymen	165	55.8	10.3	29.1	2.4	1.2	0.6	0.6	-
Apprentices	54	90.7	5.6	-	-	1.9	-	1.9	-
Other	19	47.4	31.6	21.0	-	-	-	-	-

TABLE 8
Percentage Distribution of Employment across Establishment Size Groups by Occupation
Mining Industry
April, 1982

OCCUPATION	Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT OF EMPLOYEES							
Underground Mine Workers	1,628	49.3	-	21.0	7.8	12.5	6.7	2.6	0.2
Open Pit Mine Workers	4,309	35.7	17.7	26.8	2.0	3.6	6.4	7.7	0.1
Processing Occupations	5,744	78.3	5.7	10.2	1.5	1.3	1.8	1.0	0.1
Other Occupations	7	57.1	-	-	-	-	14.3	28.6	-
TOTAL ESTABLISHMENTS	400	1.5	1.0	3.3	1.5	3.5	9.0	61.2	19.0

TABLE 8
Percentage Distribution of Employment across Establishment Size Groups by Occupation
Mining Industry
April, 1982

OCCUPATION	Total Employees	NUMBER OF EMPLOYEES IN ESTABLISHMENT							
		1000+	500-999	200-499	100-199	50-99	20-49	2-19	1
		PERCENT OF EMPLOYEES							
Instrumentation Mechanics	130	72.3	10.0	17.7	-	-	-	-	-
Journeymen	75	70.7	13.3	16.0	-	-	-	-	-
Apprentices	52	75.0	5.8	19.2	-	-	-	-	-
Other	3	66.7	-	33.3	-	-	-	-	-
Welders	658	56.8	16.6	20.4	2.0	1.8	1.4	1.1	-
Journeymen	584	58.0	15.9	19.9	2.1	2.0	1.0	1.0	-
Apprentices	40	70.0	5.0	20.0	2.5	-	-	2.5	-
Other	34	20.6	41.2	29.4	-	-	8.8	-	-
Steel Fabricators	132	76.5	19.7	2.3	1.5	-	-	-	-
Journeymen	89	85.4	11.3	1.1	2.2	-	-	-	-
Apprentices	43	58.1	37.3	4.6	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Machinists	229	80.8	8.3	8.7	0.9	0.9	-	0.4	-
Journeymen	187	80.2	8.0	9.1	1.1	1.1	-	0.5	-
Apprentices	41	85.4	7.3	7.3	-	-	-	-	-
Other	1	-	100.0	-	-	-	-	-	-
Steamfitters/Pipefitters	274	93.4	0.7	5.8	-	-	-	-	-
Journeymen	206	93.7	1.0	5.3	-	-	-	-	-
Apprentices	68	92.6	-	7.4	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-
Carpenters	254	65.0	15.0	13.4	4.3	2.4	-	-	-
Journeymen	207	66.7	11.6	14.0	4.8	2.9	-	-	-
Apprentices	36	75.0	11.1	11.1	2.8	-	-	-	-
Other	11	-	90.9	9.1	-	-	-	-	-
Ironworkers	80	100.0	-	-	-	-	-	-	-
Journeymen	52	100.0	-	-	-	-	-	-	-
Apprentices	28	100.0	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-

TABLE 9
Number of Employees by Age Group and Sub-Industry for Selected Occupation Groups
Mining Industry
April, 1982

	SELECTED OCCUPATION GROUP								
	PROFESSIONAL			TECHNICAL			JOURNEYMEN		
	AGE			AGE			AGE		
SUB-INDUSTRY	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER
Total Industry	**1,312**	**1,217**	**95**	**1,106**	**1,018**	**88**	**4,228**	**3,877**	**351**
Metal Mines	465	438	27	392	364	28	1,958	1,821	137
Coal Mines	147	139	8	133	130	3	835	767	68
Non-Metal Mines	27	25	2	29	29	-	127	111	16
Sand Pits & Quarries	3	3	-	3	3	-	41	36	5
Services Incidental to Mining	257	244	13	105	103	2	33	31	2
Smelting & Refining	413	368	45	444	389	55	1,234	1,111	123

TABLE 10
Percent of Employees Age 55 Years and Over by Sub-Industry for Selected Occupations
Mining Industry
April, 1982

OCCUPATION	% of Employees Age 55 Years and Over						
	Total Industry	Metal Mines	Coal Mines	Non-Metal Mines	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
Total Professional & Technical Occupations	7.6	6.3	3.9	3.6	0	4.1	11.7
Total Professional Occupations	7.2	5.8	5.4	7.4	0	5.1	10.9
Chemical Engineers	20.5	0	-	-	-	-	23.5
Chemists	3.6	0	-	-	0	0	10.0
Metallurgical Engineers	9.5	9.3	0	-	-	-	11.1
Physical Metallurgists	13.3	0	-	-	-	0	33.3
Civil Engineers	23.4	50.0	12.5	50.0	-	0	25.0
Mechanical Engineers	8.9	5.9	7.1	-	-	0	11.1
Mining Engineers	8.1	4.6	11.8	0	-	22.2	25.0
Geological Engineers	10.9	0	0	-	-	13.6	13.3
Geologists	3.4	3.1	0	0	-	2.8	14.3
Electrical Engineers	5.7	0	33.3	0	-	-	3.8
Other Engineers & Scientists	2.2	0	0	0	0	7.7	2.7
Systems Analysts	3.5	7.1	0	0	-	0	3.1
Accountants	6.9	9.9	4.8	10.0	0	8.7	1.8
Other Professional Occupations	14.6	6.3	0	0	-	-	22.7
Total Technical Occupations	8.0	7.1	2.3	0	0	1.9	12.4
Electronic Technicians	11.8	100.0	-	-	-	0	7.1
Mining Technicians	6.6	10.0	0	0	-	0	-
Metallurgical, Process/Chemical	14.0	2.1	0	-	-	0	20.4
Mechanical Technicians	18.8	40.0	0	0	-	0	20.0
Environmental Technicians	9.2	7.7	0	0	-	0	12.8
Draughtsmen	5.2	2.8	0	0	-	4.0	7.5
Surveyors	4.4	3.8	11.8	0	-	0	0
Assayers	8.0	10.8	0	0	-	0	6.9
Other Engineering/Science Techs.	6.3	6.5	0	0	-	3.1	17.1
Other Technicians	7.3	0	9.1	0	0	0	11.5

TABLE 10
Percent of Employees Age 55 Years and Over by Sub-Industry for Selected Occupations
Mining Industry
April, 1982

OCCUPATION	% of Employees Age 55 Years and Over						
	Total Industry	Metal Mines	Coal Mines	Non-Metal Mines	Sand Pits & Quarries	Services Incidental to Mining	Smelting & Refining
Total Journeymen	**8.3**	**7.0**	**8.1**	**12.6**	**12.2**	**6.1**	**10.0**
Millwrights	10.5	8.3	16.3	8.3	0	0	13.4
Heavy Duty Mechanics	5.9	4.9	6.9	10.8	10.5	5.3	5.5
Auto Mechanics	3.3	1.7	6.7	0	0	-	-
Winder Electricians	25.0	0	-	-	-	-	33.3
Telecommunication Electricians	33.3	33.3	-	-	-	-	-
All Other Electricians	5.8	5.8	4.7	6.7	33.3	100.0	5.3
Electronic Technicians	0	-	0	-	-	0	-
Instrumentation Mechanics	9.3	5.1	0	-	-	-	16.1
Welders	7.4	5.8	7.0	0	14.3	0	11.4
Steel Fabricators	11.2	0	0	14.3	-	-	15.3
Machinists	9.6	10.1	0	100.0	-	0	10.7
Steam/Pipefitters	8.3	12.2	11.1	-	-	-	6.8
Carpenters	16.9	22.4	23.8	16.7	-	-	11.2
Ironworkers	13.5	-	-	-	-	-	13.5
Bricklayers	6.1	0	0	-	-	-	7.4
Painters	6.0	0	50.0	0	-	-	5.9
Sheet Metal Workers	21.4	0	0	25.0	-	-	40.0
Steam Engineers	16.2	16.7	20.0	33.3	-	-	0
Lineman	6.7	0	14.3	-	-	-	0
Industrial Warehousemen	5.9	7.7	4.8	-	-	-	-
Other Journeymen	9.1	6.7	13.8	22.2	-	0	8.1

Total Establishments = 400

Note: 0 = All employees are under 55 years of age
- = No employees in occupation

TABLE 11
Number of Employees by Age Group and Establishment Size Group for Selected Occupation Groups
Mining Industry
April, 1982

ESTABLISHMENT & SIZE GROUP	SELECTED OCCUPATION GROUP								
	PROFESSIONAL			TECHNICAL			JOURNEYMEN		
	AGE			AGE			AGE		
	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER
British Columbia	**1,312**	**1,217**	**95**	**1,106**	**1,018**	**88**	**4,228**	**3,877**	**351**
1000+	459	412	47	589	523	66	2,538	2,313	225
500-999	72	68	4	90	85	5	540	497	43
200-499	250	235	15	199	193	6	869	824	45
100-199	89	84	5	45	41	4	101	87	14
50-99	75	72	3	40	37	3	91	76	15
20-49	152	142	10	63	60	3	53	46	7
2-19	208	198	10	79	78	1	36	34	2
1 Employee Only	7	6	1	1	1	-	-	-	-

TABLE 12
Percent of Employees Age 55 Years and Over by Establishment Size Group for Selected Occupations
Mining Industry
April, 1982

OCCUPATIONS	% of Employees Age 55 Years and Over								
	BRITISH COLUMBIA	1000+	500-999	200-499	100-199	50-99	20-49	2-19	1 EMPLOYEE ONLY
Total Professional & Technical Occupations	7.6	10.8	5.6	4.7	6.7	5.2	6.0	3.8	12.5
Total Professional Occupations	7.2	10.2	5.6	6.0	5.6	4.0	6.6	4.8	14.3
Chemical Engineers	20.5	22.9	-	0	-	0	-	0	-
Chemists	3.6	8.3	0	0	-	-	0	-	-
Metallurgical Engineers	9.5	11.4	7.1	8.0	10.0	0	0	-	-
Physical Metallurgists	13.3	40.0	0	0	-	0	0	0	-
Civil Engineers	23.4	17.6	0	75.0	-	0	50.0	0	-
Mechanical Engineers	8.9	10.5	0	0	0	33.3	0	0	-
Mining Engineers	8.1	14.0	5.0	0	0	0	10.0	20.0	100.0
Geological Engineers	10.9	0	0	13.3	0	-	25.0	5.9	0
Geologists	3.4	5.0	12.5	7.7	0	0	2.3	3.0	0
Electrical Engineers	5.7	6.7	0	0	-	-	-	0	-
Other Engineers & Scientists	2.2	2.0	0	0	-	0	0	10.0	0
Systems Analysts	3.5	5.3	0	0	0	0	0	-	-
Accountants	6.9	0	9.1	4.2	12.0	8.0	13.6	7.4	-
Other Professional Occupations	14.6	18.8	0	25.0	6.7	-	0	-	-
Total Technical Occupations	8.0	11.2	5.6	3.0	8.9	7.5	4.8	1.3	0
Electronic Technicians	11.8	7.1	-	-	100.0	-	0	-	-
Mining Technicians	6.6	15.4	12.5	0	0	0	0	0	-
Metallurgical, Process/Chemical	14.0	16.9	0	6.3	0	0	-	-	-
Mechanical Technicians	18.8	20.0	0	25.0	100.0	0	-	0	-
Environmental Technicians	9.2	10.4	11.1	0	0	0	-	0	-
Draughtsmen	5.2	7.5	0	0	0	0	7.1	0	-
Surveyors	4.4	10.5	0	2.6	0	0	0	-	-
Assayers	8.0	9.5	9.1	2.6	14.3	28.6	9.1	33.3	-
Other Engineering/Science Techs.	6.3	8.1	0	4.5	0	33.3	10.0	0	0
Other Technicians	7.3	11.3	0	0	25.0	0	0	0	-

TABLE 12

Percent of Employees Age 55 Years and Over by Establishment Size Group for Selected Occupations

Mining Industry

April, 1982

OCCUPATIONS	% of Employees Age 55 Years and Over								
	BRITISH COLUMBIA	1000+	500-999	200-499	100-199	50-99	20-49	2-19	1 EMPLOYEE ONLY
Total Journeymen	**8.3**	**8.9**	**8.0**	**5.2**	**13.9**	**16.5**	**13.2**	**5.6**	**-**
Millwrights	10.5	13.1	4.0	6.3	11.1	18.8	22.2	0	-
Heavy Duty Mechanics	5.9	6.3	5.2	4.7	6.3	9.1	9.7	7.1	-
Auto Mechanics	3.3	9.1	0	0	0	0	0	0	-
Winder Electricians	25.0	25.0	-	-	-	-	-	-	-
Telecommunication Electricians	33.3	-	100.0	0	-	-	0	-	-
All Other Electricians	5.8	5.2	11.3	2.9	8.3	7.1	25.0	100.0	-
Electronic Technicians	0	0	-	-	-	-	-	0	-
Instrumentation Mechanics	9.3	9.4	10.0	8.3	-	-	-	-	-
Welders	7.4	8.0	7.5	4.3	8.3	16.7	16.7	0	-
Steel Fabricators	11.2	11.8	10.0	0	0	-	-	-	-
Machinists	9.6	9.3	26.7	0	0	0	-	0	-
Steam/Pipefitters	8.3	7.8	50.0	9.1	-	-	-	-	-
Carpenters	16.9	13.8	16.7	13.8	50.0	50.0	-	-	-
Ironworkers	13.5	13.5	-	-	-	-	-	-	-
Bricklayers	6.1	6.3	-	0	-	-	-	-	-
Painters	6.0	7.3	0	0	-	-	-	-	-
Sheet Metal Workers	21.4	28.6	20.0	0	-	-	-	-	-
Steam Engineers	16.2	10.0	33.3	10.5	40.0	-	-	-	-
Linemen	6.7	7.7	0	0	-	-	-	-	-
Industrial Warehousemen	5.9	7.7	-	5.0	-	-	-	0	-
Other Journeymen	9.1	7.6	11.8	8.3	25.0	50.0	0	0	-

Note: 0 = All employees are under 55 years of age

- = No employees in occupation

TABLE 13
Number of Employees by Age Group and Region for Selected Occupation Groups
Mining Industry
April, 1982

REGIONS	SELECTED OCCUPATION GROUP								
	PROFESSIONAL			TECHNICAL			JOURNEYMEN		
	AGE			AGE			AGE		
	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER	TOTAL EMPLOYEES	UNDER 55 YRS	55 YRS & OVER
British Columbia	**1,312**	**1,217**	**95**	**1,106**	**1,018**	**88**	**4,228**	**3,877**	**351**
North	210	203	7	255	225	30	963	884	79
Interior	129	121	8	148	139	9	900	834	66
Southeast	384	340	44	488	447	41	2,013	1,835	178
Lower Mainland	556	520	36	180	173	7	77	67	10
Vancouver Island	33	33	-	35	34	1	275	257	18

TABLE 14
Percent of Employees Age 55 Years and Over by Region for Selected Occupations
Mining Industry
April, 1982

OCCUPATION	% of Employees Age 55 Years and Over					
	BRITISH COLUMBIA	NORTH	INTERIOR	SOUTHEAST	LOWER MAINLAND	VANCOUVER ISLAND
Total Professional & Technical Occupations	**7.6**	**8.0**	**6.1**	**9.7**	**5.9**	**1.4**
Total Professional Occupations	**7.2**	**3.3**	**6.2**	**11.5**	**6.5**	**0**
Chemical Engineers	20.5	0	0	25.8	0	-
Chemists	3.6	0	0	14.3	0	0
Metallurgical Engineers	9.5	6.3	15.0	9.8	9.1	0
Physical Metallurgists	13.3	0	0	33.3	0	-
Civil Engineers	23.4	20.0	100.0	17.6	42.9	-
Mechanical Engineers	8.9	0	0	10.5	14.3	0
Mining Engineers	8.1	0	4.3	13.8	11.4	0
Geological Engineers	10.9	0	0	0	13.2	-
Geologists	3.4	0	5.3	4.3	3.6	0
Electrical Engineers	5.7	0	0	8.0	0	-
Other Engineers & Scientists	2.2	2.6	0	0	4.3	-
Systems Analysts	3.5	0	10.0	5.1	0	-
Accountants	6.9	5.6	3.8	11.1	7.9	0
Other Professional Occupations	14.6	16.7	0	28.6	10.0	-
Total Technical Occupations	**8.0**	**11.8**	**6.1**	**8.6**	**4.0**	**2.6**
Electronic Technicians	11.8	100.0	-	0	33.3	-
Mining Technicians	6.6	0	0	14.8	0	100.0
Metallurgical, Process/Chemical	14.0	24.2	0	11.3	0	0
Mechanical Technicians	18.8	25.0	0	16.7	20.0	-
Environmental Technicians	9.2	25.0	0	7.0	0	0
Draughtsmen	5.2	0	0	9.1	2.3	0
Surveyors	4.4	0	10.3	6.3	0	0
Assayers	8.0	4.3	11.1	10.0	7.1	0
Other Engineering/Science Techs.	6.3	9.7	9.1	5.3	4.8	-
Other Technicians	7.3	14.7	0	7.3	0	0

TABLE 14
Percent of Employees Age 55 Years and Over by Region for Selected Occupations
Mining Industry
April, 1982

OCCUPATION	% of Employees Age 55 Years and Over					
	BRITISH COLUMBIA	NORTH	INTERIOR	SOUTHEAST	LOWER MAINLAND	VANCOUVER ISLAND
Total Journeymen	**8.3**	**8.2**	**7.3**	**8.8**	**13.0**	6.5
Millwrights	10.5	7.4	9.3	13.7	17.6	4.8
Heavy Duty Mechanics	5.9	5.1	6.1	7.0	2.9	6.5
Auto Mechanics	3.3	0	3.3	8.8	-	0
Winder Electricians	25.0	33.3	0	23.1	-	-
Telecommunication Electricians	33.3	0	-	0	-	100.0
All Other Electricians	5.8	5.1	4.2	6.0	28.6	9.5
Electronic Technicians	0	0	-	0	-	-
Instrumentation Mechanics	9.3	18.8	9.1	7.3	-	0
Welders	7.4	6.7	5.9	8.2	7.7	7.7
Steel Fabricators	11.2	13.6	0	10.9	-	0
Machinists	9.6	27.6	0	7.8	0	0
Steam/Pipefitters	8.3	5.0	23.1	7.5	-	0
Carpenters	16.9	20.8	25.0	12.2	75.0	0
Ironworkers	13.5	-	-	13.5	-	-
Bricklayers	6.1	66.7	0	0	-	-
Painters	6.0	0	0	7.2	-	-
Sheet Metal Workers	21.4	30.0	0	0	-	-
Steam Engineers	16.2	4.8	50.0	20.0	-	20.0
Linemen	6.7	0	-	8.3	-	0
Industrial Warehousemen	5.9	0	25.0	4.8	0	-
Other Journeymen	9.1	10.3	6.7	9.6	-	0

Total Establishments = 400

TABLE 15
Employment of Journeymen, Apprentices, Others and Apprentice-Journeyman Ratio By Trade
Mining Industry - Total
April, 1982

APPRENTICEABLE TRADES	NUMBER OF EMPLOYEES						* APPRENTICE: JOURNEYMEN RATIO
	JOURNEYMEN				APPRENTICES	OTHERS	
	TOTAL	Certified	Non-Certified	Status Unknown			
Occupation:							
Total Journeymen	**4,228**	**1,457**	**611**	**2,160**	**1,374**	**327**	**1:3.1**
Millwrights	782	272	109	401	265	53	1:3.0
Heavy Duty Mechanics	933	405	206	322	393	80	1:2.4
Automotive Mechanics	92	72	14	6	14	3	1:6.6
Winder Electricians	16	0	0	16	5	0	1:3.2
Telecommunication Electricians	3	3	0	0	1	0	1:3.0
All Other Electricians	640	251	44	345	247	6	1:2.6
Electronic Technicians	14	11	1	2	2	0	1:7.0
Instrumentation Mechanics	75	16	6	53	52	3	1:1.4
Welders	584	211	121	252	40	34	1:14.6
Steel Fabricators	89	10	9	70	43	0	1:2.1
Machinists	187	55	8	124	41	1	1:4.6
Steamfitters/Pipefitters	206	24	1	181	68	0	1:3.0
Carpenters	207	48	31	128	36	11	1:5.8
Ironworkers	52	0	0	52	28	0	1:1.9
Bricklayers	33	1	0	32	6	0	1:5.5
Painters	50	6	5	39	11	3	1:4.5
Sheet Metal Workers	14	6	1	7	4	0	1:3.5
Steam Engineers	37	6	20	11	4	8	1:9.2
Linemen	15	3	1	11	11	0	1:1.4
Industrial Warehousemen	34	21	13	0	49	106	1:0.7
Other Journeymen	165	36	21	108	54	19	1:3.1

* Apprentice:Journeyman Ratio = Total Journeymen - Total Apprentices
1:3.1 means that, on the average, there are 3.1 Journeymen to each apprentice for a particular trade

TABLE 16
Apprentice-Journeyman Ratio for Apprenticeable Trades by Major Sub-Industry
Mining Industry
April, 1982

APPRENTICEABLE TRADES	Number of Apprentices and Apprentice-Journeyman Ratio[1]													
	Total Mining		Metal Mining		Coal Mines		Non-Metal Mines		Quarries & Sand Pits		Services Incid -ental to Mining		Smelting & Refining	
	No.[2]	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
All Apprenticeable Trades	**1,374**	**1:3.1**	**567**	**1:3.3**	**320**	**1:2.6**	**43**	**1:2.9**	**5**	**1:8.2**	**5**	**1:6.6**	**414**	**1:3.0**
Millwrights	265	1:3.0	141	1:3.3	30	1:3.1	8	1:3.0	-	0	-	0	86	1:2.3
Heavy Duty Mechanics	393	1:2.4	202	1:2.5	145	1:1.9	15	1:2.5	5	1:3.8	3	1:6.3	23	1:3.2
Auto Mechanics	14	1:6.6	10	1:6.0	4	1:7.5	-	0	-	0	-	-	-	-
Winder Electricians	5	1:3.2	2	1:2.0	-	-	-	-	-	-	-	-	3	1:4.0
Telecommunication Electricians	1	1:3.0	1	1:3.0	-	-	-	-	-	-	-	-	-	-
All Other Electricians	247	1:2.6	120	1:2.5	51	1:2.5	6	1:2.5	-	0	-	0	70	1:2.8
Electronic Technicians	2	1:7.0	-	-	-	0	-	-	-	-	1	1:8.0	1	* 1:0.0
Instrumentation Mechanics	52	1:1.4	22	1:1.8	4	1:1.8	-	-	-	-	-	-	26	1:1.2
Welders	40	1:14.6	6	1:46.3	24	1:6.5	3	1:3.7	-	0	-	0	7	1:17.6
Steel Fabricators	43	1:2.1	18	1:0.9	2	1:3.0	4	1:1.7	-	-	-	-	19	1:3.1
Machinists	41	1:4.6	11	1:6.3	4	1:7.5	-	0	-	-	-	0	26	1:3.2
Steam/Pipefitters	68	1:3.0	16	1:2.6	10	1:1.8	-	-	-	-	-	-	42	1:3.5
Carpenters	36	1:5.8	9	1:8.4	7	1:3.0	2	1:6.0	-	-	-	-	18	1:5.4
Ironworkers	28	1:1.9	-	-	-	-	-	-	-	-	-	-	28	1:1.9
Bricklayers	6	1:5.5	2	1:2.0	-	0	-	-	-	-	-	-	4	1:6.7
Painters	11	1:4.5	1	1:12.0	1	1:2.0	-	0	-	-	-	-	9	1:3.8
Sheet Metal Workers	4	1:3.5	1	1:3.0	3	1:0.7	-	0	-	-	-	-	-	0
Steam Engineers	4	1:9.2	2	1:12.0	-	0	2	1:1.5	-	-	-	-	-	0
Linemen	11	1:1.4	1	1:5.0	7	1:7.0	-	-	-	-	-	-	3	1:1.0
Industrial Warehousemen	49	1:0.7	21	1:0.6	28	1:0.7	-	-	-	-	-	-	-	-
Other Apprenticeable Trades	54	1:3.1	1	1:45.0	-	0	3	1:3.0	-	-	1	1:1.0	49	1:1.7

1. Apprentice - Journeyman Ratio = Total Journeymen - Total Apprentices
   1:3.1 means that, on the average, there are 3.1 Journeymen to each apprentice for a particular trade.

NOTE: 0 = No Apprentices, Journeymen only
- = No Apprentices, No Journeymen
* = No Journeymen, Apprentices only

2. Number of apprentices in a particular trade by sub-industry.

TABLE 17
Establishment Training Rate for Apprenticeable Trades by Major Sub-Industry
Mining Industry
April, 1982

APPRENTICEABLE TRADES	Number of Establishments with Journeyman and the Establishment Training Rate[1]													
	Total Mining		Metal Mining		Coal Mines		Non-Metal Mines		Quarries & Sand Pits		Services Incidental to Mining		Smelting & Refining	
	No.[2]	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Apprenticeable Trades	**75**	**49.3**	**36**	**58.3**	**4**	**100.0**	**4**	**50.0**	**16**	**18.75**	**12**	**33.3**	**3**	**100.0**
Millwrights	39	64.1	27	66.7	4	75.0	2	50.0	2	0	1	0	3	100.0
Heavy Duty Mechanics	57	54.4	28	67.9	4	100.0	3	33.3	10	30.0	10	20.0	2	100.0
Auto Mechanics	20	40.0	15	40.0	3	66.7	1	0	1	0	-	-	-	-
Winder Electricians	3	100.0	1	100.0	-	-	-	-	-	-	-	-	2	100.0
Telecommunication Electricians	4	25.0	4	25.0	-	-	-	-	-	-	-	-	-	-
All Other Electricians	38	68.4	26	76.9	4	75.0	2	50.0	2	0	1	0	3	66.7
Electronic Technicians	4	66.7	-	-	2	0	-	-	-	-	1	100.0	1	100.0
Instrumentation Mechanics	15	93.3	11	90.9	2	100.0	-	-	-	-	-	-	2	100.0
Welders	42	26.2	25	16.0	4	100.0	2	100.0	8	0	1	0	2	50.0
Steel Fabricators	11	90.9	7	85.7	1	100.0	1	100.0	-	-	-	-	2	100.0
Machinists	26	38.5	18	38.9	3	33.3	1	0	-	-	2	0	2	100.0
Steam/Pipefitters	13	53.8	8	37.5	3	66.7	-	-	-	-	-	-	2	100.0
Carpenters	25	40.0	20	25.0	2	100.0	1	100.0	-	-	-	-	2	100.0
Ironworkers	1	100.0	-	-	-	-	-	-	-	-	-	-	1	100.0
Bricklayers	5	60.0	2	50.0	1	0	-	-	-	-	-	-	2	100.0
Painters	10	33.3	5	20.0	2	50.0	1	0	-	-	-	-	2	50.0
Sheet Metal Workers	5	40.0	2	50.0	1	100.0	1	0	-	-	-	-	1	0
Steam Engineers	7	28.6	4	25.0	1	0	1	100.0	-	-	-	-	1	0
Linemen	7	71.4	3	33.3	2	100.0	-	-	-	-	-	-	2	100.0
Industrial Warehousemen	8	62.5	6	50.0	2	100.0	-	-	-	-	-	-	-	-
Other Apprenticeable Trades	19	21.1	14	7.1	1	0	1	100.0	-	-	1	100.0	2	50.0

1 Establishment Training Rate = Percent of total Establishments with journeyman that employ apprentices
2 Total establishments = Total number of establishments that employ journeyman in a particular trade

Note: 0 = No apprentices, journeyman only
- = No apprentices and no journeyman

TABLE 18
Apprentice-Journeyman Ratio for Apprenticeable Trades by Establishment Size Group
Mining Industry
April, 1982

APPRENTICEABLE TRADES	Number of Apprentices and Apprentice-Journeyman Ratio[1]																	
	All Establishments		1000+		500 - 999		200 - 499		100 - 199		50 - 99		20 - 49		2 - 19		1 employee only	
	No.[2]	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
All Apprenticeable Trades	**1374**	**1:3.1**	**816**	**1:3.1**	**229**	**1:2.4**	**269**	**1:3.0**	**24**	**1:4.2**	**4**	**1:22.3**	**8**	**1:6.6**	**4**	**1:9.0**	**-**	**-**
Millwrights	265	1:3.0	142	1:3.0	57	1:1.8	60	1:3.2	5	1:3.6	1	1:32.0	-	0	-	0	-	-
Heavy Duty Mechanics	393	1:2.4	181	1:2.4	91	1:1.7	100	1:2.4	12	1:2.7	1	1:22.0	7	1:4.4	1	1:15.0	-	-
Auto Mechanics	14	1:6.6	4	1:8.2	4	1:6.2	6	1:4.5	-	0	-	0	-	0	-	0	-	-
Winder Electricians	5	1:3.2	5	1:3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Telecommunication Electricians	1	1:3.0	-	-	1	1:1.0	-	0	-	-	-	-	-	0	-	-	-	-
All Electricians	247	1:2.6	139	1:2.9	42	1:1.7	61	1:2.2	3	1:4.0	1	1:14.0	1	1:4.0	-	0	-	-
Electronic Technicians	2	1:7.0	1	1:6.0	-	-	-	-	-	-	-	-	-	-	1	1:8.0	-	-
Instrument Mechanics	52	1:1.4	39	1:1.4	3	1:3.3	10	1:1.2	-	-	-	-	-	-	-	-	-	-
Welders	40	1:14.6	28	1:12.1	2	1:46.5	8	1:14.5	1	1:12.0	-	0	-	0	1	1:6.0	-	-
Steel Fabricators	43	1:2.1	25	1:3.0	16	1:0.6	2	1:0.5	-	0	-	-	-	-	-	-	-	-
Machinists	41	1:4.6	35	1:4.3	3	1:5.0	3	1:5.7	-	0	-	0	-	-	-	0	-	-
Steam/Pipefitters	68	1:3.0	63	1:3.1	-	0	5	1:2.2	-	-	-	-	-	-	-	-	-	-
Carpenters	36	1:5.8	27	1:5.1	4	1:6.0	4	1:7.2	1	1:10.0	-	0	-	-	-	-	-	-
Ironworkers	28	1:1.9	28	1:1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bricklayers	6	1:5.5	4	1:8.0	-	-	2	1:0.5	-	-	-	-	-	-	-	-	-	-
Painters	11	1:4.5	11	1:3.7	-	0	-	0	-	-	-	-	-	-	-	-	-	-
Sheet Metal Workers	4	1:4.5	3	1:2.3	-	0	1	1:2.0	-	-	-	-	-	-	-	-	-	-
Steam Engineer	4	1:9.2	-	0	2	1:1.5	-	0	2	1:2.5	-	-	-	-	-	-	-	-
Lineman	11	1:1.4	10	1:1.3	1	1:1.0	-	0	-	-	-	-	-	-	-	-	-	-
Industrial Warehouseman	49	1:0.7	22	1:0.6	-	-	27	1:0.7	-	-	-	-	-	-	-	0	-	-
Other Apprenticeable Trades	54	1:3.1	49	1:1.9	3	1:5.7	-	0	-	0	1	1:2.0	-	0	1	1:1.0	-	-

1. Apprentice - Journeyman Ratio = Total Journeymen - Total Apprentices
   1:3.1 means that, on the average, there are 3.1 Journeymen to each apprentice for a particular trade.

NOTE: 0 = No Apprentices, Journeymen only
- = No Apprentices & No Journeymen
* = No Journeymen, Apprentices only

2. Number of Apprentices in a particular trade within an establishment size group

TABLE 19
Establishment Training Rate for Apprenticeable Trades by Establishment Size Group
Mining Industry
April, 1982

APPRENTICEABLE TRADES	Number of Establishments with Journeymen and the Establishment Training Rate[1]																	
	All Establishments		1000+		500 - 999		200 - 499		100 - 199		50 - 99		20 - 49		2 - 19		1 employee only	
	No.[2]	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
All Apprenticeable Trades	**75**	**49.3**	**6**	**100.0**	**4**	**100.0**	**12**	**100.0**	**4**	**75.0**	**9**	**33.3**	**19**	**26.3**	**21**	**19.0**	**-**	**-**
Millwrights	39	64.1	6	100.0	4	100.0	12	100.0	4	50.0	6	16.7	5	0	2	0	-	-
Heavy Duty Mechanics	57	54.4	6	100.0	4	100.0	12	100.0	4	75.0	7	14.3	13	30.8	11	9.1	-	-
Auto Mechanics	20	40.0	2	100.0	3	100.0	10	30.0	2	0	1	0	1	0	1	0	-	-
Winder Electricians	3	100.0	3	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Telecommunication Electricians	4	25.0	-	-	2	50.0	1	0	-	-	-	-	1	0	-	-	-	-
All Electricians	38	68.4	6	100.0	4	100.0	12	100.0	4	50.0	8	12.5	3	33.3	1	0	-	-
Electronic Technicians	4	66.7	3	33.3	-	-	-	-	-	-	-	-	-	-	1	100.0	-	-
Instrument Mechanics	15	93.3	6	100.0	2	100.0	7	85.7	-	-	-	-	-	-	-	-	-	-
Welders	42	26.2	6	66.7	4	25.0	12	33.3	4	25.0	5	0	6	0	5	20.0	-	-
Steel Fabricators	11	90.9	5	100.0	4	100.0	1	100.0	1	0	-	-	-	-	-	-	-	-
Machinists	26	38.5	6	83.3	4	50.0	11	27.3	2	0	2	0	-	-	1	0	-	-
Steam/Pipefitters	13	53.8	6	100.0	2	0	5	20.0	-	-	-	-	-	-	-	-	-	-
Carpenters	25	40.0	6	83.3	3	66.7	9	22.2	3	33.3	4	0	-	-	-	-	-	-
Ironworkers	1	100.0	1	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bricklayers	5	60.0	4	50.0	-	-	1	100.0	-	-	-	-	-	-	-	-	-	-
Painters	10	33.3	6	50.0	3	0	1	0	-	-	-	-	-	-	-	-	-	-
Sheet Metal Workers	5	40.0	2	50.0	2	0	1	100.0	-	-	-	-	-	-	-	-	-	-
Steam Engineer	7	28.6	2	0	1	100.0	3	0	1	100.0	-	-	-	-	-	-	-	-
Lineman	7	71.4	5	80.0	1	100.0	1	0	-	-	-	-	-	-	-	-	-	-
Industrial Warehouseman	8	62.5	1	100.0	-	-	6	66.7	-	-	-	-	-	-	1	0	-	-
Other Apprenticeable Trades	19	21.1	3	33.3	4	25.0	6	0	2	0	2	50.0	1	0	1	100.0	-	-

[1] Establishment Training Rate = Percent of Total Establishments with Journeymen that Employ Apprentices

[2] Number of Establishments with journeymen in a particular trade

Note: 0 = No apprentices, journeymen only
- = No apprentices and no journeymen

TABLE 20

Apprentice-Journeymen Ratio for Apprenticeable Trades by Region
Mining Industry
April 1982

APPRENTICEABLE TRADES	NUMBER OF APPRENTICES AND APPRENTICE-JOURNEYMEN RATIO[1]											
	British Columbia		North		Interior		Southeast		Lower Mainland		Vancouver Island	
	No.[2]	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio
All Apprenticeable Trades	**1,374**	**1:3.1**	**315**	**1:3.1**	**250**	**1:3.6**	**737**	**1:2.7**	**6**	**1:12.8**	**66**	**1:4.2**
Millwrights	265	1:3.0	86	1:2.5	57	1:3.6	111	1:2.7	1	1:17.0	10	1:4.2
Heavy Duty Mechanics	393	1:2.4	103	1:2.1	85	1:3.1	165	1:2.0	5	1:6.8	35	1:2.7
Auto Mechanics	14	1:6.6	5	1:3.4	3	1:10.0	4	1:8.0	-	-	2	1:6.5
Winder Electricians	5	1:3.2	1	1:3.0	0	-	4	1:3.2	-	-	-	-
Telecommunication Electricians	1	1:3.0	-	0	1	*1:0.0	-	0	-	-	-	0
All Other Electricians	247	1:2.6	64	1:2.1	51	1:2.8	118	1:2.6	-	0	14	1:3.0
Electronic Technicians	2	1:7.0	2	1:4.0	-	-	-	0	-	-	-	-
Instrumentation Mechanics	52	1:1.4	12	1:1.3	4	1:2.8	34	1:1.2	-	-	2	1:4.0
Welders	40	1:14.6	4	1:33.5	3	1:50.7	33	1:7.1	-	0	-	0
Steel Fabricators	43	1:2.1	12	1:1.8	7	1:0.3	23	1:2.8	-	-	1	1:1.0
Machinists	41	1:4.6	4	1:7.3	5	1:5.0	31	1:4.1	-	0	1	1:5.0
Steam/Pipefitters	68	1:3.0	4	1:5.0	6	1:2.2	58	1:3.0	-	-	-	0
Carpenters	36	1:5.8	9	1:5.9	2	1:12.0	25	1:4.9	-	0	-	0
Ironworkers	28	1:1.9	-	-	-	-	28	1:1.9	-	-	-	-
Bricklayers	6	1:5.5	1	1:3.0	2	1:0.5	3	1:9.7	-	-	-	-
Painters	11	1:4.5	-	0	-	0	11	1:2.6	-	-	-	-
Sheet Metal Workers	4	1:4.5	-	0	1	1:2.0	3	1:0.7	-	-	-	-
Steam Engineers	4	1:9.2	4	1:5.3	-	0	-	0	-	-	-	0
Linemen	11	1:1.4	1	1:2.0	-	-	9	1:1.3	-	-	1	1:1.0
Industrial Warehousemen	49	1:0.7	-	0	21	1:0.2	28	1:0.7	-	0	-	-
Other Apprenticeable Trades	54	1:3.1	3	1:9.7	2	1:7.5	49	1:2.3	-	-	-	0

1. Apprentice:Journeymen Ratio = Total Journeymen - Total Apprentices

NOTE: 0 = No Apprentices, Journeymen only
- = No Apprentices & No Journeymen
* = No Journeymen, Apprentices only

2. Number of Apprentices in a particular trade

TABLE 21
Establishment Training Rates for Apprenticeable Trades by Region
Mining Industry
April 1982

APPRENTICEABLE TRADES	Number of Establishments with Journeymen & the Establishment Training Rate[1]											
	British Columbia		North		Interior		Southeast		Lower Mainland		Vancouver Island	
	No.[2]	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
All Apprenticeable Trades	**75**	**49.3**	**19**	**63.2**	**16**	**62.5**	**14**	**50.0**	**7**	**57.1**	**19**	**21.1**
Millwrights	39	64.1	13	69.2	11	72.7	8	62.5	2	100.0	5	20.0
Heavy Duty Mechanics	57	54.4	15	66.7	12	66.7	11	54.5	6	66.7	13	23.1
Auto Mechanics	20	40.0	6	50.0	7	28.6	5	40.0	2	50.0	-	-
Winder Electricians	3	100.0	1	100.0	-	-	2	100.0	-	-	-	-
Telecommunication Electricians	4	25.0	1	0	1	100.0	1	0	1	0	-	-
All Other Electricians	38	68.4	13	84.6	10	80.0	6	83.3	4	50.0	5	0
Electronic Technicians	4	66.7	2	100.0	-	-	2	0	-	-	-	-
Instrumentation Mechanics	15	93.3	7	100.0	3	66.7	4	100.0	1	100.0	-	-
Welders	42	26.2	11	27.3	10	10.0	7	100.0	5	0	9	0
Steel Fabricators	11	90.9	4	100.0	3	66.7	3	100.0	1	100.0	-	-
Machinists	26	38.5	9	22.2	10	40.0	5	60.0	1	100.0	1	0
Steam/Pipefitters	13	53.6	3	33.3	4	50.0	5	80.0	1	0	-	-
Carpenters	25	40.0	10	50.0	8	12.5	4	100.0	1	0	2	0
Ironworkers	1	100.0	-	-	-	-	1	100.0	-	-	-	-
Bricklayers	5	60.0	1	100.0	1	100.0	3	33.3	-	-	-	-
Painters	10	33.3	4	0	2	0	4	75.0	-	-	-	-
Sheet Metal Workers	5	40.0	3	0	1	100.0	1	100.0	-	-	-	-
Steam Engineers	7	28.6	3	66.7	2	0	1	0	1	0	-	-
Linemen	7	71.4	2	50.0	-	-	4	75.0	1	100.0	-	-
Industrial Warehousemen	8	62.5	2	0	3	100.0	2	100.0	-	-	1	0
Other Apprenticeable Trades	19	21.1	7	14.3	6	33.3	4	25.0	2	0	-	-

1. Establishment Training Rate = Percent of Total Establishments with Journeymen that Employ Apprentices
2. Number of Establishments with journeymen in a particular trade

NOTE: 0 = No Apprentices, Journeymen only
- = No Apprentices & No Journeymen

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APPENDIX 1A

EMPLOYER QUESTIONNAIRE

Province of British Columbia

BRITISH COLUMBIA MANPOWER SURVEY
(Large Establishments)

Sponsored by the Government of British Columbia
with the cooperation of the B.C. Mining Association
and the Occupational Training Council

THE INFORMATION COLLECTED FROM INDIVIDUAL FIRMS AND COMPANIES WILL BE HELD IN CONFIDENCE BY THE SPONSORING MINISTRIES. THE DATA WILL ONLY BE USED FOR THE PURPOSE OF COMPILING AGGREGATE STATISTICS FOR THE INDUSTRY.

0101

Corrections to Label (if any)

For Office Use

A. This questionnaire should be completed for the establishment described on the label above. Please indicate any corrections to the label in the space above.

B. In what year did this establishment commence operations? 19 . .

C. PAYROLL PERIOD: The employment figures in this report are for the payroll period that includes April 19, 1982. However, if for any reason this period was not typical (e.g. due to temporary shutdown, work stoppages, etc.) please report for the most recent typical period, and specify that period here: _____.

For Office Use

D. What was the total number of paid employees (full-time and part-time) in this reporting unit in the payroll period? (See note C above). Do NOT include persons employed by contractors or subcontractors working for your company.

PART A

1. In column (1) please break down the total employment reported on page 1 into the following eight occupational categories. Each employee should be counted in only one of the eight categories. Employees should be classified on the basis of their current job, not on the basis of their qualifications. Column (2) indicates the subsequent parts of this questionnaire to be completed if employees are reported in column (1).

	OCCUPATIONAL CATEGORY	(1) Present Number of Employees	(2) Part of Questionnaire to be Completed
1	MANAGERS, ADMINISTRATIVE AND RELATED OCCUPATIONS - include senior managers, division managers, personnel officers, inspectors, purchasing officers, superintendents and foremen. Do not include accountants. Do not include clerks, typists, secretaries or bookkeepers, who are working for managers or administrative persons.		
2	PROFESSIONAL AND TECHNICAL OCCUPATIONS - include geologists, chemists, engineers, accountants, economists and professionals, together with technicians, technologists, draughtsmen, analysts and other technical workers. Include supervisors of professional and technical staff whose work is primarily of a professional or technical nature. Do not include tradesmen in this category.		PART B
3	CLERICAL AND RELATED OCCUPATIONS AND SALES AND SERVICE OCCUPATIONS: examples include clerks, secretaries, typists, bookkeepers, office machine operators, sales staff, security officers, cafeteria staff, janitorial staff, and supervisors for any of these occupations.		
4	APPRENTICEABLE TRADES - examples include tradesmen in maintenance and construction occupations (e.g. millwrights, electricians, heavy duty mechanics, carpenters, etc.) and their apprentices. Also include persons doing tradesmen work. Exclude helpers and labourers and include them below in either Occupational Category 5, 6 or 7.		PART C
5	UNDERGROUND MINE WORKERS - examples include drift, raise or shaft development workers, specialist drillers, explosive specialists, haulage and transport workers, ground support and timbering specialists and helpers, captains, leaders or bosses.		
6	OPEN PIT OR SURFACE MINE WORKERS - examples include specialty drillers, explosive specialists, heavy equipment operators, truck drivers, and helpers, captains, leaders and bosses.		
7	PROCESSING OCCUPATIONS - include persons concerned with the crushing, cleaning concentrating, etc. of mineral ores, coal, sand or gravel such as mill workers and helpers, captains, leaders or bosses.		
8	OTHER OCCUPATIONS - include all persons not included in any of the above categories.		PART D
	TOTAL (should agree with question D on page 1)		

Instructions for Parts B to D. These sections request the number of employees for selected occupations within the broad categories used in Part A. Breakdowns by age are also required in most cases.

The last two columns in Parts B and C request your best estimates of future requirements for each occupational category in 1984 and 1986. Please provide forecasts of the average number of positions that will be required in each occupation bearing in mind such factors as continuing present needs, major capital expenditures and expansion plans and technological change. DO NOT add increases to allow for retirement and turnover.

PART B

PROFESSIONAL AND TECHNICAL OCCUPATIONS		PRESENT NUMBER OF EMPLOYEES			FORECAST AVERAGE NUMBER OF POSITIONS	
		All Present Employees	AGE			
			Under 55	55 & over	1984	1986
1. Chemical Engineers	2101					
2. Chemists	2201					
3. Metallurgical Engineers (including extractive Metallurgists)	2102					
4. Physical Metallurgists	2202					
5. Civil Engineers	2103					
6. Mechanical Engineers	2104					
7. Mining Engineers	2105					
8. Geological Engineers	2106					
9. Geologists	2203					
10. Electrical Engineers	2107					
11. Other Engineers or Scientists not listed above eg. Geophysicists, Mineralogists, Biologists, Petroleum Engineers (please specify occupations and number employed) _____ _____ _____						
12. Systems Analysts and Computer Programmers	2401					
13. Accountants	2402					
14. Other Professional Occupations not so far included eg. Doctors, Lawyers, Economists, mathematicians etc. (please specify occupation and number employed) _____ _____ _____						
15. Electronic or Electrical Technicians/Technologists (exclude those trained through apprenticeship)	2801					
16. Mining Technicians/Technologists	2802					
17. Metallurgical, Process or Chemical Technicians/Technologists	2803					
18. Mechanical Technicians/Technologists	2804					
19. Environmental Technicians/Technologists	2805					
20. Draughtsmen	2806					
21. Surveyors	2807					
22. Assayers (some assayers may be called lab technicians)	2808					
23. Other Engineering or Science Technicians/Technologists	2898					
24. Other Technicians/Technologists not so far listed	2998					
Total (should agree with total in Professional and Technical Category on page 2)	3000					

PART C

APPRENTICEABLE TRADES (Do not include foremen or superintendents)		PRESENT NUMBER OF EMPLOYEES							Forecast Average Number of JOURNEYMEN	
		JOURNEYMEN					APPRENTICES	OTHER CATEGORIES (DO NOT INCLUDE HELPERS OR LABOURERS)		
		CERTIFIED	NON-CERTIFIED	TOTAL JOURNEYMEN	AGE - ALL JOURNEYMEN					
					Under 55	55 & over			1984	1986
1. Millwrights (Mining Machinery Mechanics, Machinery Erectors)	4001									
2. Heavy Duty Mechanics	4002									
3. Automotive Mechanics	4003									
4. Winder Electrician (Motor Winders)	4004									
5. Telecommunication Electricians (Communication Electricians, Communication Technicians)	4005									
6. All other Electricians	4006									
7. Electronic Technicians (only include apprenticeship trained)	4007									
8. Instrumentation Mechanics	4008									
9. Welders (Arc Welders, Electric Spot Welders, Pipe Welders, Flame Cutters)	4009									
10. Steel Fabricators	4010									
11. Machinists (Machinist Fitters, Maintenance Machinists, Precision Machinists, Tool Machinists)	4011									
12. Steamfitters and Pipefitters	4012									
13. Carpenters	4013									
14. Ironworkers	4014									
15. Bricklayers	4015									
16. Painters	4016									
17. Sheet Metal Workers	4017									
18. Steam Engineers (Power Engineers)	4018									
19. Lineman	4019									
20. Industrial Warehousemen (all warehousemen who are not journeymen or apprentices should be placed in the helpers category)	4020									
21. Other Apprenticeable Trades not so far listed - eg. Vulcanizers, Blacksmiths, Partsmen, Plumbers, Leadburners, Roofing Damp and Waterproofing, Sprinklerfitters, Moulders, Glaziers, Cement Masons, Plastic and Rubber Fabricators, etc. (please specify) _____ _____ _____										
Total (should agree with total in Apprenticeable Trades Category on page 2)	4000									

PART D

If you have reported any jobs in the eighth occupational category on page 2 (i.e. "Other Occupations") please describe these jobs below.

Job Title or Description		Present Number of Employees
Total (should agree with total in Other Category on Page 2)	0000	

Thank you for your cooperation in completing this questionnaire. Please return it in the envelope provided.

Completed by: _____ Contact phone number: _____

APPENDIX 1B
EMPLOYEE QUESTIONNAIRE

BRITISH COLUMBIA MANPOWER SURVEY

For Office Use

The information requested on this questionnaire is needed to assist industry, labour organizations, and government in planning to meet British Columbia's demands for skilled labour in the future. All individual information will be kept strictly confidential and will be used only for producing statistical summaries. Your completed questionnaire should be mailed directly to the Ministry of Labour in Victoria in the envelope provided.

For Office Use

1. Year of birth 1 9 ☐☐

2. Sex ☐ Male ☐ Female

3. (a) Have you always lived in B.C.? ☐ Yes - go to question 4. ☐ No - go to question 3(b).

(b) Year of most recent move to B.C. 1 9 ☐☐

(c) Where did you live prior to moving to B.C.? _____ (Province, or if outside Canada, Country)

4. (a) What is the highest grade or year of elementary or secondary (high) school you have taken. (Persons educated outside Canada should report the equivalent level of schooling according to the education system of B.C.) _____

(b) In which province or country was this highest grade completed? _____ (Province, or other Country)

5. Please list in the table below any of the following types of education or training that you have taken.

a) a full-time occupational or career-oriented course of three months or longer (e.g. apprenticeship training, vocational courses, career-oriented courses at community colleges or institutes of technology. Do not include high school courses.)
b) a university education that resulted in a degree, certificate or diploma.
c) a university education of one year or more that did NOT result in a degree, certificate or diploma

If you have taken none of the above, check this box ☐ and go to question 6.

Field of Training Subject or Course or Major Field of Study (If apprenticeship training please specify e.g. Millwright Apprentice)	Name and Location of Educational Institution (Where Applicable)	Start Date (Month & Year)	End Date (Month & Year)	Licence, Certificate, Diploma or Degree Obtained (If any)
1.		☐☐	☐☐	
2.		☐☐	☐☐	
3.		☐☐	☐☐	
4.		☐☐	☐☐	

(If you have more than four, please continue in the comments section on the next page.)

6. Please complete the following table by describing your current job and your most recent previous job that lasted 3 months or more. In the case of the previous job, if you had a different occupation with the same employer specify below. If not, specify your previous job with a different employer.

	CURRENT JOB	PREVIOUS JOB (If you have not worked before, check box [ ] and go to question 7)
a) Job Title/Kind of work (e.g. drift driller, mining engineer, heavy duty mechanic)		
b) Most important activities or duties in this work. (e.g. operating percussion drill, designing mining facilities, maintenance of heavy equipment)		
c) Employer (Name of company or government agency)		
d) Kind of industry, business or service (e.g. copper mine, sandstone quarry, logging)	FOR OFFICE USE	
e) Location of work (nearest town if in B.C., province, or country)		
f) When did you commence this job? (Month and year)		
	For Office Use	For Office Use

7. If you have taken apprenticeship training, please describe below the major sponsor of your training.

a) Employer (Name of Company) _____
b) Location of work (nearest town) _____
c) Kind of industry _____

Office Use

Thank you for your cooperation. Please mail the completed questionnaire in the pre-paid envelope provided.

Appendix 2 a
Operating Mines, Mills and Smelters and their Head Offices
Participating Establishments in Mining Survey
April, 1982

Company Name	Establishment Name or Name of Mine	Location	Region	Principal Mineral	Type of Operation	Range # of Emps
Aluminium Company of Canada Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	20-49
Alcan Smelters & Chemicals Ltd.	Alcan Smelters	Kitimat	North	Aluminium	Smelting	1000+
Amax of Canada Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Amax of Canada Ltd.	Kitsault Mine	Kitsault	North	Molybdenum	Open Pit	200-499
Atlin Drain Lease Partnership	-	Surrey	Lower Mainland	Placer Gold	Open Pit	1-19
B.C. Coal Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	50-99
B.C. Coal Ltd.	Sparwood Operations	Sparwood	Southeast	Coal	Open Pit & U/G	1000+
Bethlehem Copper Corporation	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Bethlehem Copper Corporation	Ashcroft Mine	Ashcroft	Interior	Copper/Moly	Open Pit	200-499
Brenda Mines Ltd.	Brenda Mine	Peachland	Interior	Copper/Moly	Open Pit	200-499
Brinco Mining Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	20-49
Brinco Mining Ltd.	Cassiar Asbestos Division	Cassiar	North	Asbestos	Open Pit	500-999
Byron Creek Collieries Ltd.	Byron Creek Collieries	Corbin	Southeast	Coal	Open Pit	100-199
Canada Tungsten Mining Corporation	-	Vancouver	Lower Mainland	Tungsten	Processing	20-49
Canada Wide Mines Ltd.	Granduc Operations	Stewart	North	Copper	Underground	200-499
Carolin Mines Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Carolin Mines Ltd.	Carolin Mine	Hope	Lower Mainland	Gold Quartz	Underground	100-199
Cominco Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	200-499
Cominco Ltd.	Kimberley Operations	Kimberley	Southeast	Lead/Zinc	Underground	1000+
Cominco Ltd.	Trail Operations	Trail	Southeast	Lead/Zinc	Smelting	1000+
Cominco Ltd.	Fording Operations	Elkford	Southeast	Coal	Open Pit	1000+
Crows Nest Resources Ltd.	Line Creek Operations	Sparwood	Southeast	Coal	Open Pit	200-499
Cyprus Anvil Mining Corporation	Head Office	Vancouver	Lower Mainland	-	H/O	50-99
Dankoe Mines Ltd.	Horn Silver Mine	Keremeos	Interior	Silver	Underground	1-19
Dalsor Enterprises Ltd.	Dalsor Enterprises Ltd.	Surrey	Lower Mainland	Placer Gold		1-19
Delta Smelting & Refining Corp.	Delta Smelting & Refining	Richmond	Lower Mainland	Gold	Smelting	50-99
Denison Mines Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	50-99
Dickenson Mines Ltd.	Silvana Division	New Denver	Southeast	Silver	Underground	20-49
Dimac Resource Corporation	Silence Lake	Clearwater	Interior	Tungsten		20-49
Doloshite Mines Ltd.	Doloshite Mines	Rock Creek	Southeast	Doloshite	Quarry	1-19
Dupont of Canada Exploration Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Dupont of Canada Exploration Ltd.	Baker Mine	Black Lake	North	Silver	Underground	20-49
Engelhard Industries of Canada Ltd.	Engelhard Ind. of Canada	Delta	Lower Mainland		Smelting	1-19

Appendix 2 a
Operating Mines, Mills and Smelters and their Head Offices
Participating Establishments in Mining Survey
April, 1982

Company Name	Establishment Name or Name of Mine	Location	Region	Principal Mineral	Type of Operation	Range # of Emps
Erickson Gold Mining Corporation	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Erickson Gold Mining Corporation	Erickson Creek Gold Mine	Cassiar	North	Gold Quartz	Underground	50-99
Fisons Western Corporation	Fisons Western Corporation	Vancouver	Lower Mainland	Peat Moss		20-49
Fisons Western Corporation	Fisons Western Corporation	Delta	Lower Mainland	Peat Moss		50-99
Gavex, A Resource Corporation	Gavex, A Resource Corp.	Kamloops	Interior	Placer Gold		20-49
Irving Place Ltd.	Irving Placer Ltd.	Spruce Ck.	North	Placer Gold		1-19
Iscan Resources Ltd.	-	Vancouver	Lower Mainland	Copper	Open Pit	1-19
Lornex Mining Corporation Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Lornex Mining Corporation Ltd.	Lornex Mine	Logan Lake	Interior	Copper	Open Pit	1000+
Mountain Minerals Company Ltd.	Golden Silica Plant	Golden	Southeast	Silica	Processing	20-49
Mountain Minerals Company Ltd.	Moberly Mine	Golden	Southeast	Silica	Open Pit	1-19
Mountain Minerals Company Ltd.	Brisco Mine	Brisco	Southeast	Barite	Underground	1-19
Mountain Minerals Company Ltd.	Parson Mine	Parson	Southeast	Barite	Underground	1-19
Newmont Mines Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Newmont Mines Ltd.	Similkameen Mining Division	Princeton	Interior	Copper	Open Pit	200-499
Noranda Mines Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Noranda Mines Ltd.	Bell Mine Babine Division	Granisle	North	Copper	Open Pit	200-499
Noranda Mines Ltd.	Boss Mountain Division	Hendrix Lk.	Interior	Molybdenum	Underground	100-199
Noranda Mines Ltd.	Goldstream Division	Revelstoke	Interior	Copper	Underground	50-99
Noranda Mines Ltd.	Granisle Mine Babine Div.	Granisle	North	Copper	Open Pit	200-499
Norbeck Explorations Ltd.	-	Quesnel	North	Placer Gold		1-19
Northair Mines Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Northair Mines Ltd.	Northair Mine	Squamish	Lower Mainland	Gold Quartz	Underground	50-99
Northair Mines Ltd.	Scottie Gold Mine	Stewart	North	Gold Quartz	Underground	50-99
Orell Resources Ltd.	-	Salmon Arm	Interior	Lead/Zinc	Processing	1-19
Pengally Mines Ltd.	-	Kaslo	Southeast	Silver	Underground	1-19
Pineland Peat Farms Ltd.	-	Delta	Lower Mainland	Peat Moss		1-19
Placer Development Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	100-199
Placer Development Ltd.	Endako Mines Division	Endako	North	Molybdenum	Open Pit	500-999
Placer Development Ltd.	Equity Silver Mine	Houston	North	Silver	Open Pit	200-499
Placer Development Ltd.	Gibraltar Mines Ltd.	McLesse Lk.	Interior	Copper/Moly	Open Pit	500-999
Placer Development Ltd.	Craigmont Mine	Merritt	Interior	Copper	Open Pit	50-99

Appendix 2 a
Operating Mines, Mills and Smelters and their Head Offices
Participating Establishments in Mining Survey
April, 1982

Company Name	Establishment Name or Name of Mine	Location	Region	Principal Mineral	Type of Operation	Range # of Emps
Queenstake Resources Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
R. & M. Mining	-	Invermere	Southeast	Placer Gold		1-19
Rasko Exploration Ltd. (NPL)	-	Vancouver	Lower Mainland	Gold Quartz	Milling	1-19
Robert Mines Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Robert Mines Ltd.	Robert Mine	Greenwood	Southeast	Silver	Processing	1-19
Ruth Vermont Mine Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Silver Tusk Mines Ltd.	-	Vancouver	Lower Mainland	Silver	Underground	1-19
Spruceton Aggregates Ltd.	-	Nanaimo	Vancouver Island		Open Pit	1-19
Superior Peat Inc.	-	Nanaimo	Interior	Peat Moss	Open Pit	1-19
Teck Corporation Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	100-199
Teck Corporation Ltd.	Beaverdell Division	Beaverdell	Southeast	Silver	Underground	20-49
Teck Corporation Ltd.	Afton Mine	Kamloops	Interior	Copper	Open Pit	200-499
Teck Corporation Ltd.	Highmont Mine	Logan Lake	Interior	Copper/Moly	Open Pit	200-499
The Mosquito Creek Gold Mining Co.Ltd	-	Wells	North	Placer Gold	Underground	20-49
United Hearne Resources Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
United Hearne Resources Ltd.	Taurus Gold Mine	Cassiar	North	Gold Quartz	Underground	20-49
Utah Mines Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	20-49
Utah Mines Ltd.	Island Copper Mine	Port Hardy	Vancouver Island	Copper/Moly	Open Pit	500-999
Valley Copper Mines Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Westfrob Mining, Div. of Falconbridge	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Westfrob Mining, Div. of Falconbridge	Head Office - Sub.	Delta	Lower Mainland	-	H/O - Sub.	1-19
Westfrob Mining, Div. of Falconbridge	Tasu Mine	Tasu	North	Iron	Underground	100-199
Westmin Resources Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	20-49
Westmin Resources Ltd.	Westmin Resources	Campbell Rv	Vancouver Island	Copper	Underground	200-499
Westroc Industries Ltd.	-	Invermere	Southeast	Gypsum	Open Pit	20-49

There were an additional 23 non-operating establishments with employees that participated in the survey.

Appendix 2b
Establishments Servicing the Mining Industry (20 or more employees*)
Participating Establishments in Mining Survey
April, 1982

Company Name	Establishment Name or Name of Mine	Location	Region	Range # of Emps
Amax Minerals Corporation	-	Vancouver	Lower Mainland	20-49
Anaconda Canada Exploration Ltd.	-	Vancouver	Lower Mainland	20-49
Bow Valley Resource Service Ltd.	Connors Drilling Division	Kamloops	Interior	50-99
Canadian Mine Services Ltd.	-	Vancouver	Lower Mainland	50-99
Canadian Superior Exploration Ltd.	-	Vancouver	Lower Mainland	20-49
D.W. Coates Enterprises Ltd.	-	Richmond	Lower Mainland	20-49
Drilcor Industries Ltd.	-	Richmond	Lower Mainland	20-49
E. & B. Explorations Inc.	-	Vancouver	Lower Mainland	20-49
Imperial Limestone Co. Ltd.	-	Vananda	Vancouver Island	20-49
J.T. Thomas Diamond Drilling Ltd.	-	Smithers	North	50-99
Longyear Canada Inc.	Annacis Island	New Westmin	Lower Mainland	20-49
Noranda Exploration Co. Ltd.	-	Vancouver	Lower Mainland	20-49
Placer Development Ltd.	Exploration Only	Vancouver	Lower Mainland	20-49
D.J. Drilling Company Ltd.	-	Surrey	Lower Mainland	20-49
Rainbow Diamond Drilling Ltd.	-	Merritt	Interior	20-49

* There were an additional 210 establishments in the mining service sub-industry with less than 20 employees that participated in the survey.

Appendix 2 c
Operating Quarries and Sand Pits and Their Head Offices
Participating Establishments in Mining Survey
April, 1982

Company Name	Establishment Name or Name of Mine	Location	Region	Principal Mineral	Type of Operation	Range # of Emps
A.D. Booth Limited	-	Salmon Arm	Interior	Gravel	Open Pit	1-19
Abbotsford Gravel Sales Ltd.	-	Abbotsford	Lower Mainland	Gravel	Open Pit	1-19
Agassiz Ready-Mix Concrete & Gravel	-	Agassiz	Lower Mainland	Gravel	Open Pit	1-19
Allard Contractors Ltd.	-	Pt. Coquit.	Lower Mainland	Gravel	Open Pit	20-49
Argus Aggregates Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Argus Aggregates Ltd.	Egmont Operations	Egmont	Lower Mainland	Gravel	Open Pit	20-49
Alpa Properties Ltd.	-	Bowen Isl.	Lower Mainland	Gravel	Open Pit	1-19
Blackhams Construction Ltd.	-	Abbotsford	Lower Mainland	Gravel	Open Pit	1-19
Border Sand & Gravel Ltd.	-	Surrey	Lower Mainland	Gravel	Open Pit	1-19
Camaro Gravel Supplies	-	Pt. Coquit.	Lower Mainland	Gravel	Open Pit	1-19
Canada Cement Lafarge Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Canada Cement Lafarge Ltd.	Vananda Operations	Vananda	Vancouver Island	Limestone Qu.	Open Pit	20-49
Cannon Contracting Ltd.	-	Mission	Lower Mainland	Gravel	Open Pit	1-19
Cascadio & Son Holding Co. Ltd.	-	Cache Creek	Interior	Gravel	Open Pit	1-19
Chilliwack Gravel Sales Ltd.	-	Chilliwack	Lower Mainland	Gravel	Open Pit	1-19
Coast Aggregates Ltd.	-	Squamish	Lower Mainland	Gravel	Open Pit	1-19
Construction Aggregates Ltd.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Construction Aggregates Ltd.	-	Victoria	Vancouver Island	Gravel	Open Pit	50-99
Creston Sand & Gravel Sales	-	Creston	Southeast	Sand & Gravel	Open Pit	1-19
Davies Sand & Gravel Ltd.	-	Mission	Lower Mainland	Sand & Gravel	Open Pit	1-19
Delta Aggregates Ltd.	-	Delta	Lower Mainland	Gravel	Open Pit	20-49
Domtar Inc.	Lime Division	Blubber Bay	Vancouver Island	Limestone Qu.	Open Pit	20-49
Eastside Aggregates Ltd.	-	Penticton	Interior	Gravel	Open Pit	1-19
Fort St. John Sand & Gravel Ltd.	-	Ft.St. John	North	Sand & Gravel	Open Pit	1-19
Fulbrook Contracting Inc.	-	Vernon	Interior	Sand & Gravel	Open Pit	1-19
Glendale Ready-Mix Ltd.	-	Williams Lk	Interior	Gravel	Open Pit	1-19
Glowstone Quarries Ltd. (NPL)	-	Creston	Southeast	Rock Quarry	Open Pit	1-19
Goodbrand Construction Ltd.	Aggregates Division	Aldergrove	Lower Mainland	Gravel	Open Pit	1-19
Hilltop Sand & Gravel Co. Ltd.	-	Kelowna	Interior	Sand & Gravel	Open Pit	1-19
Ideal Basic Industries Inc.	Head Office	Vancouver	Lower Mainland	-	H/O	1-19
Ideal Basic Industries Inc.	Rock Products Division	Vananda	Vancouver Island	Rock Quarry	Open Pit	20-49
J.H. Hansen Holding Ltd.	-	Fort Nelson	North	Sand & Gravel	Open Pit	1-19

Appendix 2 C
Operating Quarries and Sand Pits and Their Head Offices
Participating Establishments in Mining Survey
April, 1982

Company Name	Establishment Name or Name of Mine	Location	Region	Principal Mineral	Type of Operation	Range # of Emps
Kirkpatrick-Sand & Gravel Ltd.	-	Maple Ridge	Lower Mainland	Sand & Gravel	Open Pit	1-19
L.R. Wyles Trucking Ltd.	-	Penticton	Interior	Sand & Gravel	Open Pit	1-19
Lake Windermere Sand & Gravel	-	Rad.Hot Spr	Southeast	Sand & Gravel	Open Pit	1-19
Metro Sand & Gravel Ltd.	-	Kamloops	Interior	Sand & Gravel	Open Pit	1-19
Nels Ostero Ltd.	-	Taylor	North	Sand & Gravel	Open Pit	1-19
River Valley Contractors Ltd.	Head Office	Chilliwack	Lower Mainland	-	H/O	1-19
Sabre Bulldozing Ltd.	-	Whistler	Lower Mainland	Sand & Gravel	Open Pit	1-19
Sholinder & MacKay Sand & Gravel Ltd	-	Invermere	Southeast	Sand & Gravel	Open Pit	1-19
Shuswap Sand & Gravel	-	Chase	Interior	Sand & Gravel	Open Pit	1-19
Similkameen Crushing Ltd.	-	Princeton	Interior	Gravel	Open Pit	1-19
Steel Brothers Canada Ltd.	-	Cache Creek	Interior	Limestone Qu.	Open Pit	20-49
Valley Gravel Sales Ltd.	-	Aldergrove	Lower Mainland	Gravel	Open Pit	1-19
Vic Froese Trucking Ltd.	-	Terrace	North	Sand & Gravel	Open Pit	1-19
W.E. Robertson Construction Co. Ltd.	-	Pr. George	North	Gravel	Open Pit	1-19
Yellowhead Concrete	-	Kamloops	Interior	Sand Quarry	Open Pit	1-19
Alpha Lake Aggregates Ltd.	-	W. Whistler	Lower Mainland	Gravel	Open Pit	1-19
Arrowsmith Sand & Gravel Ltd.	-	Chemainus	Vancouver Island	Sand & Gravel	Open Pit	1-19
Carr Sand & Gravel Ltd.	-	Albion	Lower Mainland	Sand & Gravel	Open Pit	1-19
Central Aggregates Ltd.	-	Abbotsford	Lower Mainland	Gravel	Open Pit	1-19
Fraser Valley Aggregates Ltd.	-	Surrey	Lower Mainland	Gravel	Open Pit	1-19
Goldstream Meadows Ltd.	-	Victoria	Vancouver Island	Gravel	Open Pit	1-19
Mara Sand & Gravel Ltd.	-	Sicamous	Interior	Sand & Gravel	Open Pit	1-19
Terrace Calcium Products Ltd.	-	Terrace	North	Rock Quarry	Open Pit	1-19
Woodbrook Aggregates Ltd.	-	Abbotsford	Lower Mainland	Gravel	Open Pit	1-19
Weber Brothers Construction Co. Ltd.	-	Quesnel	North	Stone Quarry	Open Pit	1-19

There were an additional 5 non-operating sand pits and quarries with employees that participated in the survey.

APPENDIX 2 d

Number of Establishments By Sub-Industry and Region
Mining Industry
April 1982

Sub-Industry	Total British Columbia		North		Interior		Southeast		Lower Mainland		Vancouver Island	
	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%
Metal Mines	84	21.0	15	24.6	16	29.1	11	28.2	40	17.3	2	16.7
Coal Mines	7	1.8	1	1.6	-	-	4	10.3		0.9	-	-
Non-Metal Mines	15	3.7	2	3.3	1	1.8	6	15.4	5	2.1	1	8.3
Stone Quarries, Sand Pits	62	15.5	9	14.8	13	23.6	4	10.2	29	12.4	7	58.3
Services Incidental to Mining	225	56.2	33	54.1	25	45.5	13	33.3	152	65.2	2	16.7
Smelting & Refining	7	1.8	1	1.6	-	-	1	2.6	5	2.1	-	-
Total	400	100.0	61	100.0	55	100.0	39	100.0	233	100.0	12	100.0

APPENDIX 2 e

Number of Establishments By Sub-Industry and Establishment Size Group
Mining Industry
April 1982

Sub-Industry	British Columbia		1000+ Employees		500 - 999 Employees		200 - 499 Employees		100 - 199 Employees		50 - 99 Employees		20 - 49 Employees		Less Than 20 Employees	
	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number Establishments	%
Metal Mines (Includes Milling)	84	100.0	2	2.4	3	3.6	11	13.2	5	5.6	6	7.2	11	13.2	46	54.8
Coal Mines	7	100.0	2	28.6	-	-	1	14.3	1	14.3	2	28.6	1	14.3	-	-
Non-Metal Mines	15	100.0	-	-	1	6.7	-	-	-	-	1	6.7	4	26.7	9	60.0
Stone Quarries, Sand Pits	62	100.0	-	-	-	-	-	-	-	-	1	1.6	7	11.3	54	87.1
Services Incidental to Mining	225	100.0	-	-	-	-	-	-	-	-	3	1.3	12	5.3	210	93.3
Smelting & Refining	7	100.0	2	28.6	-	-	1	14.3	-	-	1	14.3	1	14.3	2	28.6
Total	400	100.0	6	1.5	4	1.0	13	3.2	6	1.5	14	3.5	36	9.0	321	80.2

APPENDIX 2 f

Number of Establishments By Establishment Size Group and Region
Mining Industry
April 1982

Establishment Size Group	Total British Columbia		North		Interior		Southeast		Lower Mainland		Vancouver Island	
	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%	Number of Establishments	%
1000+ Employees	6	1.5	1	1.6	1	1.8	4	10.2	-	-	-	-
500 - 999 Employees	4	1.0	2	3.3	1	1.8	-	-	-	-	1	8.3
200 - 499 Employees	13	3.2	5	8.2	5	9.1	1	2.6	1	0.4	1	8.3
100 - 199 Employees	6	1.5	1	1.6	1	1.8	1	2.6	3	1.3	-	-
50 - 99 Employees	14	3.5	3	4.9	3	5.5	-	-	7	3.0	1	8.3
20 - 49 Employees	36	9.0	4	6.6	4	7.3	4	10.2	20	8.6	4	33.3
< 20 Employees	321	80.2	45	73.8	40	72.7	29	74.4	202	86.7	5	41.7
Total	400	100.0	61	100.0	55	100.0	39	100.0	233	100.0	12	100.0

APPENDIX 3.

GLOSSARY OF TERMS

The following is a summary of the Standard Industrial Classifications covered in each of the mining sub-industries surveyed in this study, and a brief summary of each of these S.I.C.'s.

1. Metal Mines:

   i) Placer Gold Mines (051) - Establishments primarily engaged in mining gold by placer or hydraulic methods. This industry also includes the dressing and beneficiating of the ore and the production of bullion at the site of the mine.

   ii) Gold Quartz Mines (052) - Establishments primarily engaged in operating lode mines for gold. This industry also includes the dressing and beneficiating of the ore and the production of bullion at the site of the mine.

   iii) Iron Mines (058) - Establishments primarily engaged in mining iron ore and in dressing and beneficiating such ores.

   iv) Miscellaneous Metal Mines (059) - Establishments primarily engaged in mining metal ores not elsewhere classified and in dressing and beneficiating such ores. The following types of mines are included in this industry; silver, copper-gold-silver, nickel-copper, silver-colbalt, silver-lead-zinc, molybdenite, chromite, manganese, mercury, tungsten, titanium, cerium, rare earths, columbium, tantalum, antimony, magnesium and beryllium.

2. Coal Mines:

   i) Coal Mines (061) - Establishments primarily engaged in mining coal whether anthracite, bituminous or lignite. This industry includes establishments which break, wash grade or otherwise prepare coal for use as a fuel, whether operated by a coal-mining enterprise or on a contract basis.

3. Non-Metal Mines:

i) Asbestos Mines (071) - Establishments primarily engaged in mining and milling asbestos fibre.

ii) Peat Extraction (072) - Establishments primarily engaged in recovering and processing peat.

iii) Gypsum Mines (073) - Establishments primarily engaged in mining gypsum. Establishments primarily engaged in manufacturing gypsum products which also mine gypsum, are classified in Industry No 359 - Miscellaneous Non-Metallic Mineral Products Industries.

iv

-metallic minerals not elsewhere classified. This industry includes mines such as the following: soapstone and talc, barite, diatomite, mica, ochre and iron oxide, feldspar, nepheline syenite, quartz, silica, fluorspar, salt, potash, sodium sulphate, lithia, magnesite, brucite, gem stones, pumice, volcanic dust, whiting , pozzolana, kyanite, natro-alunite, sodium carbonate, magnesium sulphate, actinolite, serpentine, strontium, graphite, phosphate, pyrite.

4. Quarries and Sandpits:

i) Stone Quarries (083) - Establishments primarily engaged in quarrying and crushing igneous rocks (such as granite) or sedimentary rocks (such as limestone, marble, shale, slate and sandstone). Establishments primarily engaged in cutting, shaping or finishing stone are included in Industry No. 353 - Stone Products Manufacturers.

ii) Sand Pits or Quarries (087) - Establishments primarily engaged in the extraction, crushing and screening of sand and gravel from pits or quarries.

6. Services Incidental to Mining:

i) This industry includes establishments primarily engaged in providing services incidental to the operation of metal and non-metal mining, such as mine exploration and development work including the removal of overburden and the sinking of shafts. Old style prospecting is classified here, but geophysical surveys, gravimetric surveys and seismographic surveys are in Industry No. 864 -Engineering and Scientific Services.

APPENDIX 4.

OCCUPATION DESCRIPTIONS
PROFESSIONAL & TECHNICAL DEFINITIONS

1. Chemical Engineers - includes occupations concerned with research and design, and development of manufacturing processes in which chemical changes occur; and supervision of the construction, operation and maintenance of chemical plant equipment.

2. Chemists - includes occupations concerned with conducting basic research to extend the knowlege of the science of chemistry, and with conducting applied research to develop new or improved material, compounds and substances for commercial purposes; developing analytical methodology and techniques, and performing quantitative and qualitative analysis and experiments in organic, inorganic and physical chemistry.

3. Metallurgical Engineers (Including Extractive Metallurgists) - includes occupations concerned with studying properties and characteristics of metals; developing controlling and advising on processes for the extraction of metals from their ores; developing alloys; overseeing metal manufacturing processes for making finished products.

4. Physical Metallurgists - conducts research to investigate properties of metals, develop alloys, and advises on uses and methods of production; observes, measures and records data related to experiments on metals or metal combinations. Conducts studies of metals and alloys to determine physical characteristics. Conducts experiments in powder metallurgy, evaluates properties of metals during processes, determines type of metal to be used from a design and fabrication standpoint, advises on shortcomings of metals in use and anticipated use. Developes hot working and cooling processes to obtain desired characteristics. Supervises and co-ordinates the work of technologists and technicians and trains mill testers and inspectors in the performance of their duties.

5. Civil Engineers - includes occupations concerned with the planning, design, and supervision of the construction, maintenance and repair of buildings, bridges, dams, tunnels, ports, docks and other structures, water supply and sewer system, transportation and other facilities for public, industrial or commercial use.

6. Mechanical Engineers - includes occupations concerned with applied research, development and design of mechanical equipment and it's manufacture; supervision of the operation, mantenance or repair of machines that produce, transmit or consume power of energy and the tools with which machinery and equipment are made, and evaluation of installed plant and processes related to machines.

7. Mining Engineers - includes occupations concerned with conducting studies on mining engineering prolems; determining mine location; planning and designing the development of the mines, mine facilities, systems and equipment; advising on methods of extracting coal, minerals and metal bearing ores from the earth; planning; organizing and supervising the extraction of minerals and their preparation or processing.

8. Geological Engineers - investigates prospective areas for the occurrence of geological structure that might be oil or mineral bearing; examines and performs quantative analysis of seismic and other goelogical data, using geochemical instruments to assess development potential of mineral, gas, oil, and underground water resources. Interprets records of computations and seismic data and prepares seismic cross-section charts to evaluate methods used to locate oil and mineral-bearing structures. Studies data relating to ore deposits to advise mining engineers on most economical methods of extraction. Interprets records obtained in the field. Advises on engineering problems encountered in projects. Supervises the work of technologists and technicians.

9. Geologists - conducts research into nature and history of earth's crust to increase scientific knowledge, and to develop practical applications in mineral exploitation and engineering: Explores areas to determine underground structure of the earth and the types of minerals or rocks that may be discovered. Studies rock cores and cuttings. Classifies fossilized life forms found in geological formations, studies the nature and effect of forces, such as erosion, on the earth's surface. Investigates earth

materials for certain chemical or other reactions by exposing them to high temperature and pressures. Supervises and co-ordinates technologists and technicians in various aspects of geological activity.

10. Electrical Engineers - includes occupations concerned with the design, construction, maintenance and repair of systems which generate, transmit, distribute, control and utilize electric energy; research into electrical engineering problems and development of electrical and electronic prouduct; and provision of technical direction in the manufacture of a wide variety of electrical and electronic equipment.

11. Systems Analysts and Computer Programmers - includes occupations concerned with planning, implementing and controlling electronic data processing services and the programming of computer systems.

12. Accountants - includes persons concerned with planning and administering accounting services and advising on accountancy problems. Examples of accountants include budget accountant, cost accountant, machine processing accountant, property accountant, tax accountant and branch bank accountant.

13. Electronic/Electrical Technician/Technologist - designs circuits; constructs prototypes from approved drawings; installs and tests circuitry; repairs, maintains and modifies electronic instrumentation and apparatus. See definition under #7 of Apprenticeable Trades Definitions.

14. Mining Technician/Technologist - involved in exploration, planning and surveying, mine development and operation, mineral processing, and plant design and operation. Performs maintenance on underground drilling machines, mine engineers and other mine equipment; investigates mine equipment operation to improve production; operates equipment to obtain ore samples from drill cores or stope face for quality and quantity control. May be employed as assayers.

15. Metallurgical, Process or Chemical Technician/Technologist - conducts tests for presence and concentration of specified elements in metal ore samples and to determine physical properties of refined metal specimens. Acts as techical advisor on all matters relating to suitability, reliability, and weldability of steel. Performs tests of metal produced in processing operations for quality control.

16. Mechanical Technician/Technologist - concerned with the design, construction and installation of industrial engineering equipment, processes and products; conducts test to determine characteristics and capabilities of mechanical components and sub assemblies; selects, assembles, installs, calibrates, and tests new or modified mechanical components or assembles for industrial or power equipment, machine tools, measuring and control instruments; designs and makes metal working dies, cutting tools, jigs and fixtures. May be employed as a design draughtsman for machinery, steelwork, piping, powerplants and installations.

17. Environmental Technician/Technologist - prepares, operates and maintains field experiment and sampling stations for pollution monitoring; processes air and other source samples to determine level of pollution. Uses knowledge of habitat ecology and environmental inventory techniques to plan and implement land reclamation projects at mine sites. May act as advisor in matters reagarding processig and disposal mine and plant by-products.

18. Draughtsmen - prepares drawings of mine machinery such as conveyors and hoists from general design notes prepared by mining engineer. Makes graphic diagrams, profiles and cross-sections to show geological stratigraphy and location of mineral deposits from notes prepared by geologist or surveyor.

19. Surveyors - surveys earth's surface and oversees engineering survey parties engaged in determining exact location and measurement of points, elevations, lines, areas and contours of earth's surface to secure data from mine development. Conducts surface and underground surveys to control direction and extent of mining; computes data necessary for driving and connecting

underground passages; measures distance which shafts have advanced over set period, and calculates ore removed and broken ore remaining.

20. Assayers - tests ores and alloys, and analyzes test results to determine value and properties of precious metals, using chemical solutions and chemical or physical laboratory equipment.

21. Other Engineering or Science Technologists and Technicians - e.g. Chemical-Engineers, Technologists/Technicians, Geological Technologists/Technicians, Geophysical Technologists/Techicians, Civil-Engineering Technologists/Technicians, Industrial Engineering Technologists/Technicians.

22. Other Technologists/Tehnicians not so far listed - usually lesser skilled than the technologists/technicians who work with the Engineers and Scientists. Often is only a prestige job title for an elemental job e.g. Slope Techician, Pit Technician, etc.

Occupations in Apprenticeable Trades

1. Certified Journeyman - is an employee who has generally completed an apprenticeship program either inside or outside of Canada and has a journeyman's ticket or a Trades Qualification (T.Q.) certificate.

2. Uncertified Journeyman - is an employee who does the same work as a journeyman but has not completed an apprenticeship program and does not have a T.Q. certificate.

3. Apprentice - is an employee who is a registered apprentice with the Apprenticeship Training Branch of the Ministry of Labour.

4. Other - category embraces employees who assist journeymen and who are able to perform some, but not all of the journeyman's tasks, and who are not registered as apprentices with the Apprenticeship Training Branch.

Apprenticeable Trades Definitions

1. Millwright - a millwright is a skilled worker whose main concern is the repair, installation and maintenance of industrial machines and heavy mechanical equipment such as pulleys, conveyers, and hoists. Constructs foundations for machines, and may operate metal working machines and perform simple rigging. May be classified as a mining machinery mechanic, a treatment plants mechanic or a maitenance man. May also be referred to as a fitter (A millwright assembles and maintains parts designed and manufactured by a machinist).

2. Heavy Duty Mechanic - this skilled worker maintains, manufactures, overhauls, reconditions; and repairs equipment powered by an internal-combustion engine (graders, loaders, shovels, tractors, trucks, etc). Overhauls engines, makes body repairs, repairs lifting devices and their control mechanisms.

3. Automotive Mechanic - a journeyman auto mechanic repairs, adjusts, and replaces mechanical and electrical parts of automobiles, trucks and buses. Repairs and overhauls gasoline and diesel powered engines. May operate laths, grinder, honing and boring machines to rebore and hone cylinders. May also be called a mechanical unit repairman.

4. Winder Electrical (Motor Winder) - this skilled worker repairs, services and overhauls electric motors, generators, capacitors and power distributor transformers.

5. Telecommunications Electrician - installs, repairs and maintains wired communication equipment such as inter communication systems, switchbords, telephones, and time clocks, using circuit diagrams, testing devices, hand and power tools. May also be involved in the installation, maintenance and repair of elevators, escalators and related equiment.

6. All Other Electricians - construction electrician - installs, maintains and repairs wiring in buildings and adjacent areas to provide electric energy. Installs lighting and other fixed equipment such as conduits and switches. Industrial electrician - repairs, maintains and installs electrical wiring and equipment in commercial, industrial, institutional, other establishment. Repairs or replaces the mechanical pneumatic, hydraulic or electronic components of electrical equipment.

7. Electronic Technician/Technologist - builds, installs and repairs electronic equipment such as radar, computers, radio-transmitters, electronic monitoring and digital control devices. May design circuits and build prototypes from approved drawings. May interpret data obtained from digital monitoring and control devices.

8. Instrumentation Mechanic - this journeyman is primarily concerned with process measurement. He installs, repairs and maintains process monitoring and control instruments in industrial settings. Has a knowledge of pneumatic, hydraulic; electrical, electronic, fluic, optical, chemicalor mechanical instruments. May be called an electronic equipment repairman, utilities instrument mechanic or an instrument repairman. May be confused with an electronic technician.

9. Welders - concerned with joining, surfacing, cutting or otherwise fabricating and repairing ferrous and non-ferrous metal parts and structures using welding and cutting equipment. Activities included setting up and operating equipment; welding using oxy-acetylene, electric arc, metal inert gas or tungsten inert gas equipment; soldering using oxy-acetylene or gas blow torch, soldering iron or electric soldering gun; lead burning; cutting or perforating using oxy-acetylene cutting torch or electric arc cutting equipment. May be called arc welders, electric spot welders, pipe welders, flame cutters.

10. Steel Fabricator (Welder) - this skilled worker fabricates all types of heavy metal components (e.g. frameworks or shells for machinery, tanks, stacks; metal parts such as beams stairs and railings for buildings and bridges). He may set up and operate machinery tools such as radial drill press, end mill or edge planner. This tradesman works with plate 1/8 inch thick or thicker.

11. Machinist - this highly skilled tradesman sets up and operates various machine-tools (lathes, millers, shapers, grinders). He fits and assembles parts to make or repair mechanisms, tools or machines. Applies knowledge of mechanics, shop mathematics, metal properties, layout, mechanical drawings and machining procedures for machine work to specifications.

12. Steamfitter and Pipefitter - this journeyman studies building plans and specifications in order to select pipe, pump and related materials that convey steam or hot air in heating systems. He installs, alters and repairs steam and hot water boilers, electric oil, and gas burners, and connects pipes from these to other equipment and appliances (air conditioners, refrigerators, and industrial processing units).

13. Carpenter - a journeyman carpenter lays out, joins, assembles, erects and dismantles materials of wood, plastic, cork or composition (plywood and wallboards) using hand and power tools. May be called a construction carpenter, a maintenance carpenter or a rough carpenter.

14. Ironworker - this skilled worker is concerned with raising, positioning, and joining prefabricated structural metal parts and sub-assemblies by bolting, screwing, rivetting or welding to form or repair completed framework or structures for buildings, bridges, tanks or similar work. He may place concrete reinforcing materials, install ornamental ironwork, windows, doors and curtain walls; install conveyers and machinery; erect tower cranes and hoisting equipment and install fences, sound barriers and guard rails. Job title may be fence erector, machinery mover, precast erector, rigger, rodman, structural steel erector or tower and crane installer.

15. Bricklayer - a skilled worker who erects, repairs and replaces walls, fireplaces, sidewalks, furnaces, smoke stacks and similar structures using brick, masonry blocks, stone, marble, precast artifical masonry units, refractories and caulking. May be classed as a bricklayer, refractory brick repairman, kiln maintenance man, cupola repairmen, ladle-liner, masonry pointer and caulker.

16. Painter this skilled worker applies paints or coatings of a decorative and protective nature to a building, structure, surface or ship after having prepared the surface to be coated. May be specifically classified as a paperhanger.

17. Sheet Metal Worker - a sheet metal worker is a tradesman who cuts, forms, fabricates, assembles, installs alters or repairs a finished product from sheets of steel, aluminum, copper or plastic situated in any building, structure, ship, boat or barge. He works with plate less than 1/8 inch in thickness. May be designated according to the type of metal used or the type of activity (model maker, sheet metal installer, tinsmith).

18. Steam Engineers (Power Engineers, Stationary Engineers) - operates and maintains various types of stationary engines and mechanical equipment such as boilers, pumps, compressors, motors and generators, refrigeration, and water or industrial waste treating equipment to supply heat, power, light, steam and other utility services for buildings or industrial processes.

19. Lineman - installs, repairs and maintains network of power lines used to conduct electricity from generating plants to consumers.

20. Industrial Warehouseman - concerned with loading and unloading ships, barges, trucks, railcars, aircraft and other transporation conveyences. Activities include assembling cargo in slings; piling goods on pallets to facilitate movement; stowing cargo in ships, railcars, trucks and aircraft; moving and storing goods and material in sheds and warehouses.

APPENDIX 5

METHODOLOGY

The survey population was initially compiled using Statistics Canada's Business Register. Additions were made to this listing by the Ministry of Energy, Mines and Petroleum Resources and from the 1981 British Columbia and Yukon Chamber of Mines publication. Every effort was made to include all operating mines.[1] These refinements produced a total listing of 755 establishments. Ninety-seven proved to be incorrectly classified, (i.e. not in the mining industry), out of business or merged with other establishments. No information could be found on another twenty-eight establishments. The remaining 630 establishments were surveyed. However, 230 of these did not have any employees, leaving a population of 400 employers.

Considerable attention was given to ensuring high response rates. Therefore, two slightly different methodologies were planned with respect to the employer part of the survey (Phase 1). Employers with less than 100 employees were asked to provide the information over the phone, whereas those with 100 or more employees were interviewed in four steps, as follows:

1) initial contact by telephone explaining the nature of the two surveys (employer and employee) and mailout of employer questionnaire;

2) second call to answer any problems associated with completing the employer questionnaire and to discuss the method of distribution of employee questionnaires;

3) third call to confirm completion of employer questionnaire and arrange tentative interview date for "technological change" discussion;

4) interview of employer to determine his assessment of technological change and its impact on future demand for certain occupations.

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[1] NOTE: Self employed operations were excluded.

In Phase 2, all employees in the four major groups of interest (managerial, professional, technical and trades) were surveyed except for three large firms where sampling was employed.

Establishments with less than 100 employees distributed employee questionnaires to the groups of interest, with mail-back by the employee to the Ministry of Labour.

Establishments with more than 100 employees were requested to send a listing with name and address by occupation to the Central Statistics Bureau for mail-out of employee questionnaires. This was encouraged in order to reduce the possible survey burden on the employer. Fifteen out of 29 establishments with more than 100 employees complied with this request. The remaining participants preferred to either mail out the questionnaires fro- their establishments or distribute them within their establishments. In all cases questionnnaires were mailed back to the Ministry of Labour by the employee.

Of the 400 establishments identified in the base sample, sixty-one had no employees in relevent occupations and four employers felt it was inappropriate for them to distribute the employee questionnaires. There were 6,238 forms distributed; 135 were returned by the Post Office. Of the 6,103 questionnaires which actually reached the individuals concerned, 3,011 (49.3%) were completed and returned to the Ministry of Labour.

APPENDIX 6.

METHODOLOGICAL OBSERVATIONS

The following observations can be made concerning the survey method:

1. Collecting the information by telephone proved successful with firms having up to 100 employees.

2. There were no major problems in classifying jobs into the occupational categories, although some of the larger firms required assistance in interpreting job titles. It is felt that this can be overcome in future surveys by continuing to review existing job titles and related occupational classifications. This approach helped to ensure higher response rates and enabled the research team to capture reliable information regarding stocks of tradesmen and distributions.

3. The attempt to collect information on future manpower requirements and the impact of technological change proved less than satisfactory. This was probably because the collection phase was carried out during a major down turn in the industry when employers were focussing their attention on day-to-day concerns rather than long range planning.

4. Report 2 will have to be completed before the project team can verify the project's overall success. However, it does appear that the data collection procedures (i.e. employer/employee approach) are viable from a methodological point of view.

APPENDIX 7

COMPARISON OF MIMS AND 1981 CENSUS

The results of the 1981 Census are now available. A comparison of these results with the Manpower Study of the Mining Industry (MIMS) for the metal, non-metal and coal sub-industries reveals notable differences in employment levels and occupational distributions.

There are several reasons for this:

1. MIMS identified occupations by providing the respondent with a list of predefined categories whereas the 1981 census did not provide respondents with any classification list for their reply.

2. MIMS counted only those workers who were actually employed in the mining industry, whereas tabulations presently available from the 1981 Census include both employed and unemployed workers who had worked in the mining industry during the eighteen months prior to the Census.

3. The time reference period for MIMS and the 1981 Census differed by ten months. (Manpower Study - April 1982 and 1981 Census - June 1981).

4. The Manpower Study was based on a 100% enumeration, whereas the Census collected occupational information from only a 20% sample of the households surveyed.

5. The Census includes casual, part time and contract workers whereas MIMS included only those on the regular payroll.

6. In MIMS, occupational and industrial information relating to the employee was provided by the employer. In the Census such information is usually provided by the employee but sometimes is provided by another member of the household.

COMPARISON OF MIMS AND COPS EMPLOYMENT[1] IN MINING SUB-INDUSTRIES, BY OCCUPATION

PERCENT OF EMPLOYMENT[1] IN SUB-INDUSTRY

OCCUPATIONS	COAL		METALS		NON-METALS	
	MIMS	COPS	MIMS	COPS	MIMS	COPS
Mining Engineers	0.8	2.6	1.0	-	0.1	-
Welders	3.0	3.3	4.1	2.1	2.0	2.0
Geologists	0.5	-	0.9	-	0.5	-
Managerial, Administrative & Related	13.5	4.7	11.3	5.4	14.0	7.4
Clerical, Sales, Services & Related	9.1	9.9	8.9	8.6	17.8	12.8
Professional, Technical & Related	6.3	7.6	8.2	9.3	6.6	5.0
Mining & Quarrying Occupations (Underground & Open Pit Mine Workers)	38.4	26.3	31.2	24.7	27.8	18.5
Processing Occupations	6.1	1.0	13.3	8.0	13.2	12.1
All Occupations (Number of employees)	4,469	3,010[2]	10,461	12,643[2]	848	1,520[2]
Percent of Total Employment in Coal, Meteal & Non-Metal Mining	28.3	17.5[2]	66.3	73.6[2]	5.4	8.9[2]

1 COPS "Employment" refers to 1981 Census experienced labour force, aged 15 & over, who had worked in the industry since January 1, 1980; MIMS employment refers to workers on company payrolls in April, 1982.

2 Based on 1981 Census Data from COPS/CEIC tabulation.

NOTE:
Comparisons for total mining employment are not possible because MIMS excludes petroleum and gas sub-industry; and because the COPS report does not include smelting and refining, quarries and sandpits, and services incidental to mining in its statistical tables 12 & 13, pp. 72 & 73.

SOURCES: MIMS: Mining Industry Manpower Survey, B. C. Ministries of Labour, Education and Industry and Small Business Development, 1983.

COPS: The British Columbia Mining Industry (Sector Study for the Canadian Occupational Projection System) J. F. Bodkin, Canada Employment & Immigration Commission, B.C./Yukon Region, June, 1983. (Preliminary Draft).

MINING INDUSTRY EMPLOYMENT FROM VARIOUS SOURCES

Industry	STATISTICS CANADA				B.C. GOVERNMENT		B.C. Mining Association (1981)
	1981 Census[1] (June, 1981)	Labour Force Survey (April 1982)	Establishment Surveys (April 1982)	Census of Manufacturing (1981)	MIMS (April 1982)	Energy, Mines & Petroleum Resources (1982)	
Primary Mining	22,590	21,000	17,800[2]	-	17,747[3]	21,273[4]	20,240
Smelting & Refining	5,680	-	7,800[2]	8,067	7,555	4,177[4]	-
Total Mining Industry	28,270	-	25,600	-	25,302	25,450[4]	-

Notes:

[1] Refers to experienced labour force, aged 15 and over, who have worked in the industry since January 1, 1980

[2] Comprises the ES_1 Survey of establishments with 20 or more employees and ES_2 Survey of smaller establishments for mining; for smelting and refining, only ES_1 Survey data for primary metals is available.

[3] Excludes petroleum and natural gas sub-industry.

[4] Unpublished data for 1982; only Trail and Delta included in Smelting and Refining.

SOURCES: (1) 1981 Census of Canada. Statistics Canada.
(2) The Labour Force (SC71-001).
(3) Estimates of Employees by Province and Industry (SC72-008) and Employment Earnings and Hours (SC72-002)
(4) Smelting and Refining (SC 41-214)
(5) Mining Industry Manpower Survey, B. C. Ministries of Labour, Education and Industry and Small Business Development, 1983.
(6) B. C. Ministry of Energy, Mines and Petroleum Resources.
(7) The British Columbia Mining Industry in 1981. B. C. Mining Association.